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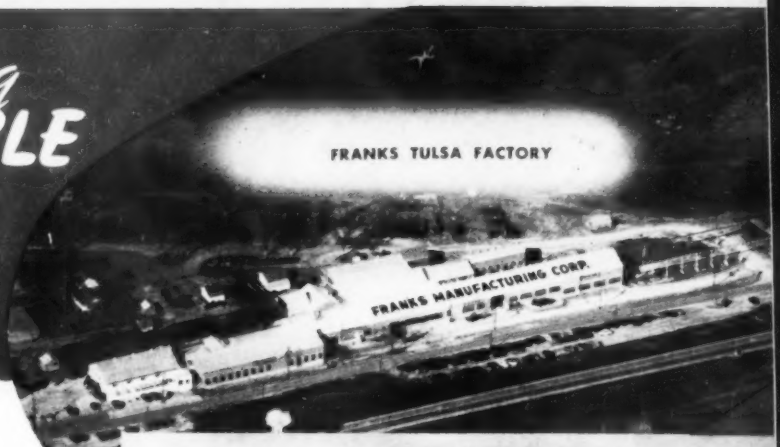
TECHNOLOGY DEPT.

the OIL AND GAS JOURNAL

APR 9 1951
DET

Merely Making PARTS AVAILABLE *is not*

WHAT FRANKS CONSIDERS FIELD SERVICE

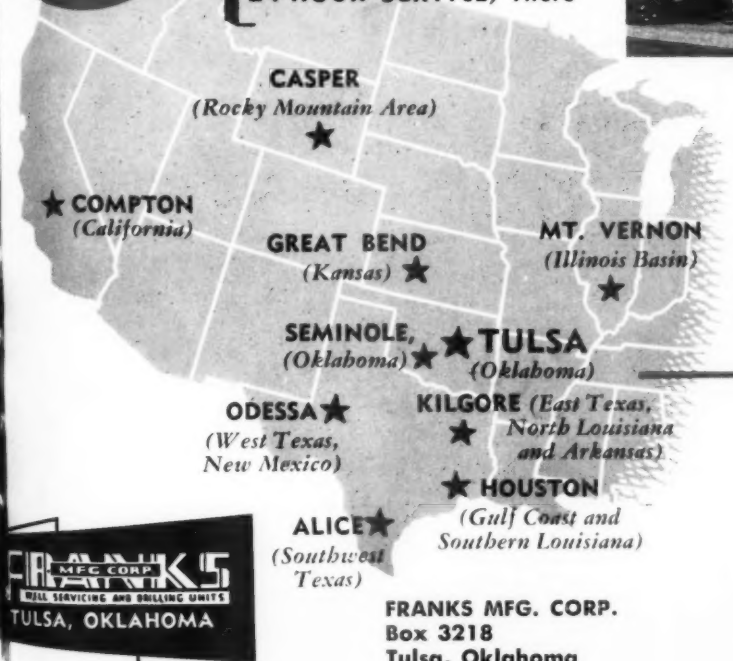


FRANKS MFG CORP TULSA OKLA. WELL SERVICING AND DRILLING UNITS

"on the SPOT" FIELD SERVICE =

STOCK of PARTS, There
Plus
TRAINED PERSONNEL, There
Plus
SHOP FACILITIES, There
Plus
24-HOUR SERVICE, There

This, as are all other stations on the map, is a typical Franks "on the spot" service center. This Odessa center shows the service manager's home nearby, so that he is available on call 24 hours of day.



FRANKS MFG CORP TULSA OKLA. WELL SERVICING AND DRILLING UNITS
TULSA, OKLAHOMA

FRANKS MFG. CORP.
Box 3218
Tulsa, Oklahoma

When you buy Franks servicing and drilling equipment you get more than mere availability of parts . . . more than general repair shop field service. You get:

1. **Stock of parts at Franks own field service centers.**
2. **Staff of Franks own factory trained men.**
3. **Franks own shop facilities, each shop being a complete repair and modification center for Franks units.**
4. **24 hour day and night (Sundays and holidays) service, as Franks service center managers live on the shop site.**

Franks service center managers represent in excess of 10 years of service per man with Franks. They are qualified and will be glad to discuss with you how Franks units can meet your needs.

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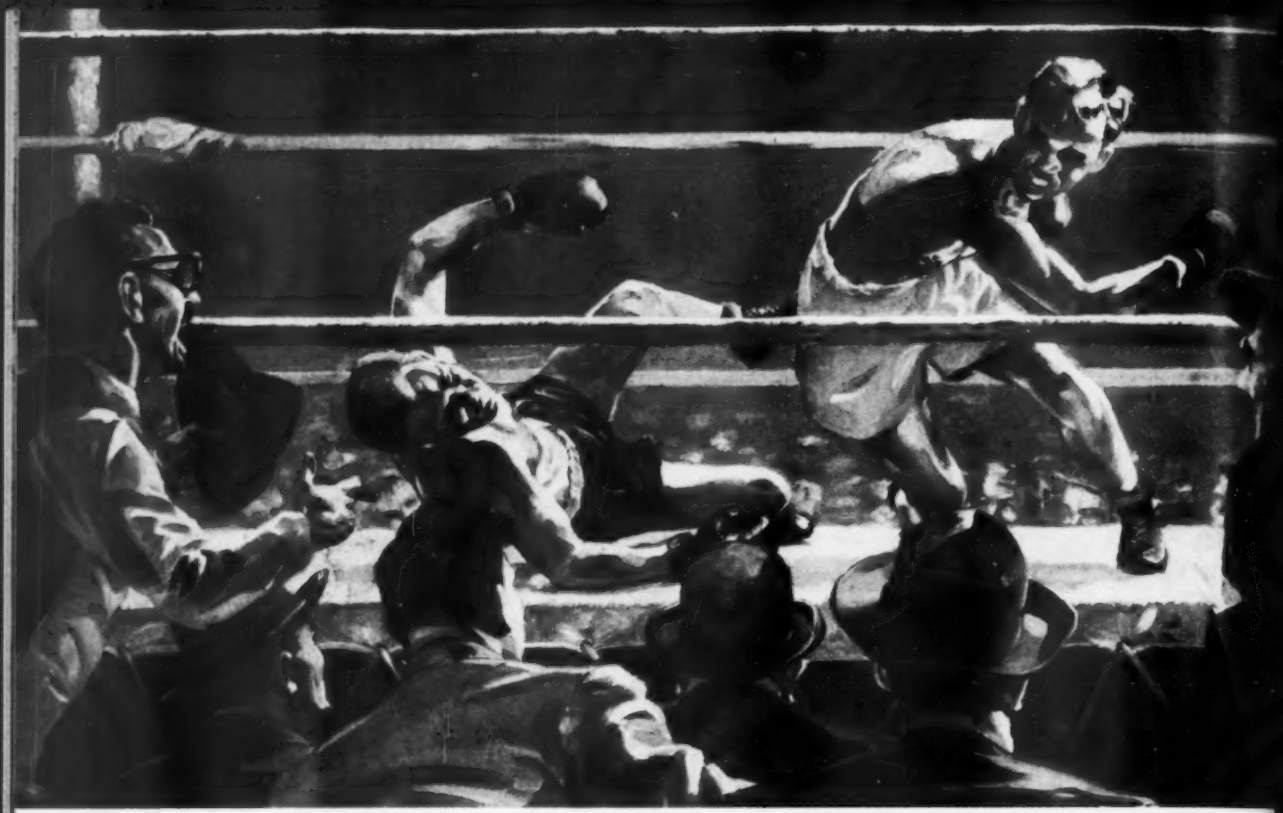

CHAMPIONS DON'T WIN BY PULLING PUNCHES

To win consistently in the ring a man has to punch as hard and straight as he knows how. And to win consistently in the sometimes uncertain business of producing oil, you have to use casing perforating that punches straight through all casing, cement and far back into the formation. The record of results in thousands of wells perforated with the modern Welex Jet Process *proves* that JETS give 300% deeper penetration than any other practical method. On job after job results have proven that JET perforating can make a profitable oil well where other methods failed. Men who know will tell you that results cost less with Welex JETS. Call your nearest Welex Station for prompt service day or night.

ORIGINATORS OF Welex JET PERFORATING

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- Antiknock ratings to check TEL susceptibility of blending stocks and octane number of finished gasolines.
- Color determinations for dye studies.
- The many standard gasoline inspection tests.
- Other assistance in the use of additives.

These Laboratories are ready not only to assist in the use of Du Pont Additives, but to check your own laboratory findings as well.

So, when you have a gasoline additive problem, let the nearest Field Laboratory make the necessary recommendations from Du Pont's complete line of gasoline additives. Just call your Petroleum Chemicals representative or write the nearest District Office listed below.

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The big, extra heavy flywheels of Fairbanks-Morse "ZC" Engines are an important advantage to you. They assure considerable fuel savings in gas or gasoline and much less wear on engine and driven equipment as compared to engines having much less flywheel effect. The big wheels store excess energy on the light load portions of the pumping cycle and use the stored energy on the heavy load portions of the cycle. Cyclic speed variations are virtually eliminated. This efficiency permits use of smaller size engines and a practically constant position of the fuel butterfly valve, thus assuring maximum fuel economy. Operators have reported fuel savings up to 50%. See the "ZC" at your supply store, or write Fairbanks, Morse & Co., Chicago 5, Illinois.

FAIRBANKS-MORSE,

a name worth remembering

"ZC" ENGINES • PUMPS • ELECTRIC MOTORS • LIGHT PLANTS GENERATORS • DIESEL AND DUAL FUEL ENGINES • SCALES

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For cable tool drilling

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You'll get maximum service from wire rope that has been specially designed for a special job. Over the years, ropes for all types of equipment in every field have been developed by Macwhyte. It will pay you to get Macwhyte Wire Rope that has been job-proved and engineered for your particular equipment. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company.

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In each BOVAIRD store you'll find capable men whose job it is to give YOU service—men to help you select the right supplies for your particular job.

BOVAIRD stores maintain complete stocks of nationally known brands of supplies, field tested and proved, to assure you of getting the supplies you need — when you need them.

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THE Bovaird SUPPLY COMPANY

GENERAL OFFICES
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80 YEARS OF PROGRESS WITH THE OIL INDUSTRY

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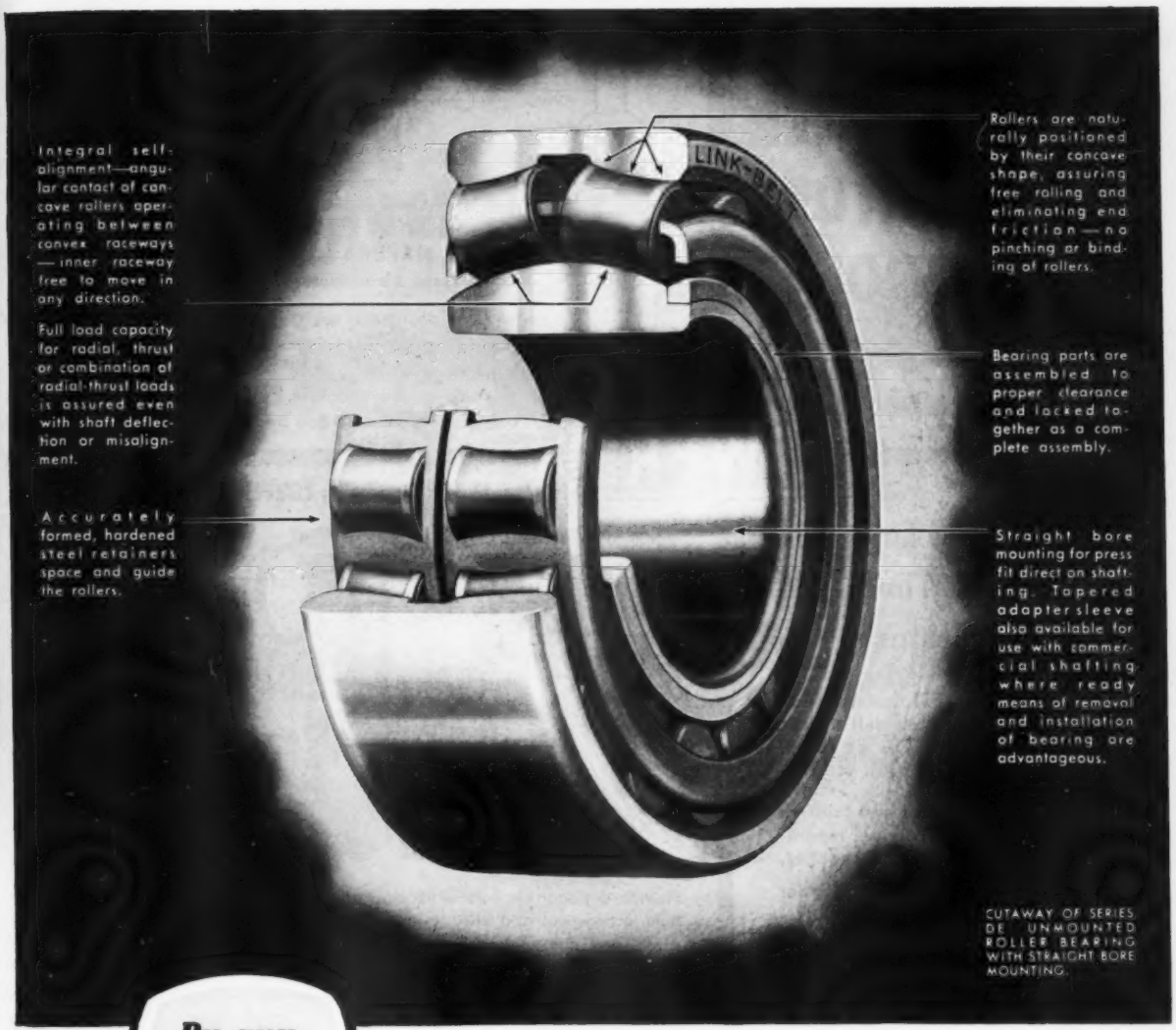
LINK-BELT Ball and Roller Bearings smooth the path of power


Integral self-alignment—angular contact of concave rollers operating between convex raceways—inner raceway free to move in any direction.
Full load capacity for radial, thrust or combination of radial-thrust loads is assured even with shaft deflection or misalignment.
Accurately formed, hardened steel retainers space and guide the rollers.
Rollers are naturally positioned by their concave shape, assuring free rolling and eliminating end friction—no pinching or binding of rollers.
Bearing parts are assembled to proper clearance and locked together as a complete assembly.
Straight bore mounting for press fit direct on shafting. Tapered adapter sleeve also available for use with commercial shafting where ready means of removal and installation of bearing are advantageous.
LINK-BELT

CUTAWAY OF SERIES DE UNMOUNTED ROLLER BEARING WITH STRAIGHT BORE MOUNTING.

By any standard . . . **LINK-BELT Roller Bearings always assure anti-friction alignment**

Integral self-alignment of Link-Belt Unmounted Roller Bearings eliminates need for expensive, cumbersome self-aligning housings. Angular contact, concave rollers between convex raceways, provides capacity for thrust and radial loading. Preadjusted for clearance at the factory and packed to reach you in "final inspection" condition, they require no adjustment when you're ready for installation. There's a Link-Belt Bearing Specialist near you who can give you expert advice on *any* bearing application. You can also get all the facts from Data Book 2550.

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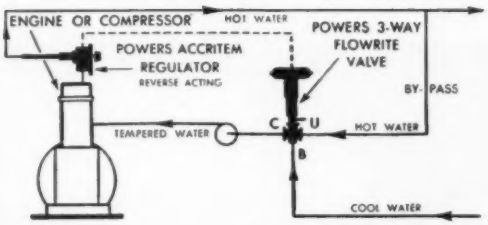
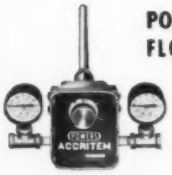
Before You Buy

JACKET WATER TEMPERATURE CONTROL

Investigate



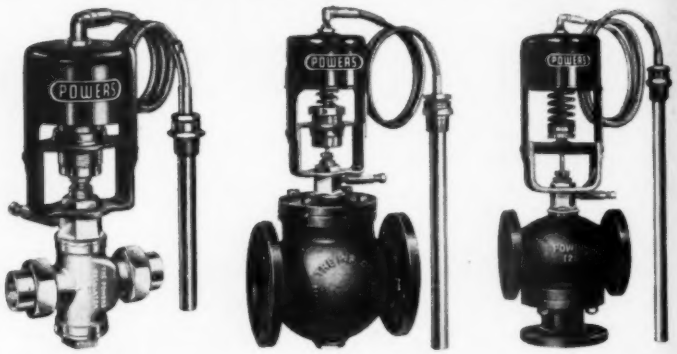


One of Many Applications of
POWERS ACCRITEM REGULATOR and FLOWRITE DIAPHRAGM VALVE—
Compressed Air or Water Operated

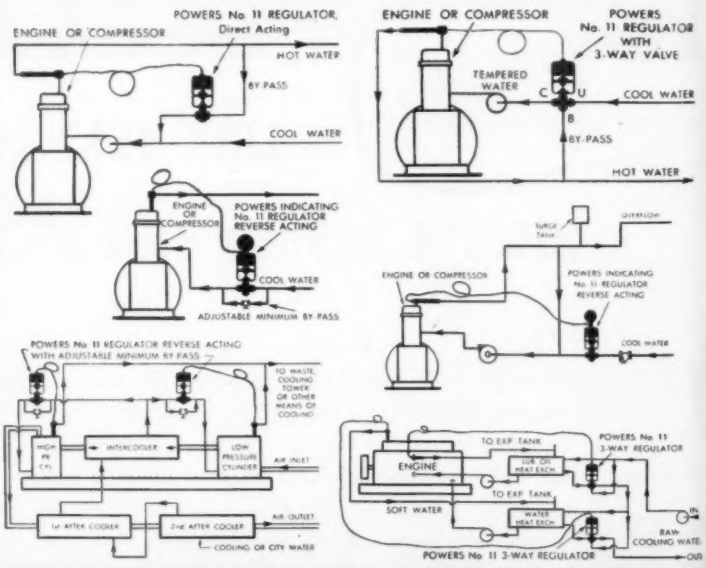
—Provides positive, dependable control for large size 3-way or 2-way valves. ***Safety feature*** of hook-up above: failure of air or water pressure allows only cooling water to flow through the valve to engine.

POWERS

No. 11 Self-Operating TEMPERATURE REGULATORS



Provide dependable control for most applications. They're simple, ruggedly built, economical and easy to install. Especially suited for air compressors, diesel and gas engines. Temperature indicating regulator also available.



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IMPORTANT ADVANTAGES that quickly pay back the cost of Powers self-operating and pneumatic controls for air compressors, diesel and gas engines:

- **Correct jacket water and lube oil temperature at all times, regardless of load or seasonal changes.**
- **Improved lubrication and cylinder liner wear.**
- **Fewer piston ring replacements.**
- **Saves Labor; increases efficiency.**
- **Reduces danger of piston seizure.**
- **Eliminates sludging.**
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Cost of Powers jacket water temperature control? About the same as a set of new piston rings. Powers regulators are unsurpassed for reliability and years of trouble free service.

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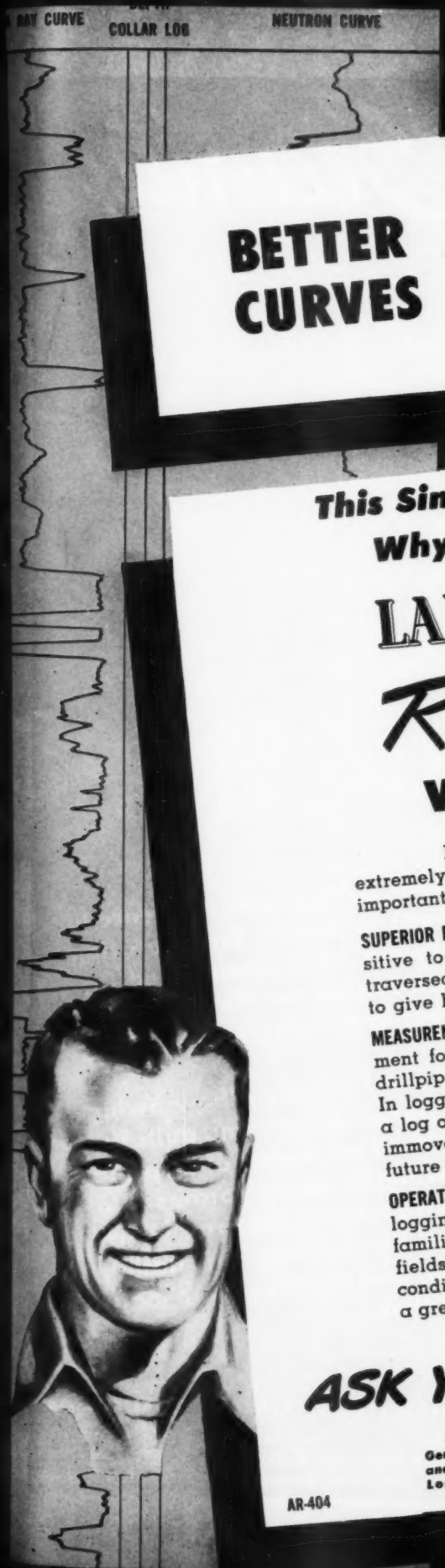

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This Simple Formula Explains Why Operators Rely on

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Radioactivity

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Lane-Wells Radioactivity Well Logging gives extremely detailed, reliable curves because of three important factors:

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MEASUREMENT ACCURACY. Lane-Wells methods and equipment for depth measurements check consistently with drillpipe and other accepted standards of depth measure. In logging cased hole, all the information is related to a log of the casing collars to provide a whole series of immovable reference points for pin-point accuracy in all future down-hole work.

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New Internal Security

S&J

A shift of a petroleum storage tank bottom with reference to the tank shell cannot damage or impair the operation of this new Shand & Jurs Swing Joint. Designated Fig. ST-235, this Swing Joint is mounted on the tank shell only. Should a tank bottom settle or shift, the S&J Swing Joint will be unaffected.

The stationary elbow of this S&J double elbow Swing Joint mounts on the internal nozzle flange, and pulls the swing elbow tightly against itself by means of a spring loaded rod. A boss on the swinging elbow rotates in a thrust bearing supported by two telescoping arms which are extended to the tank shell for welding. This design facilitates original installation, and contributes to long, trouble-free swing joint operation.

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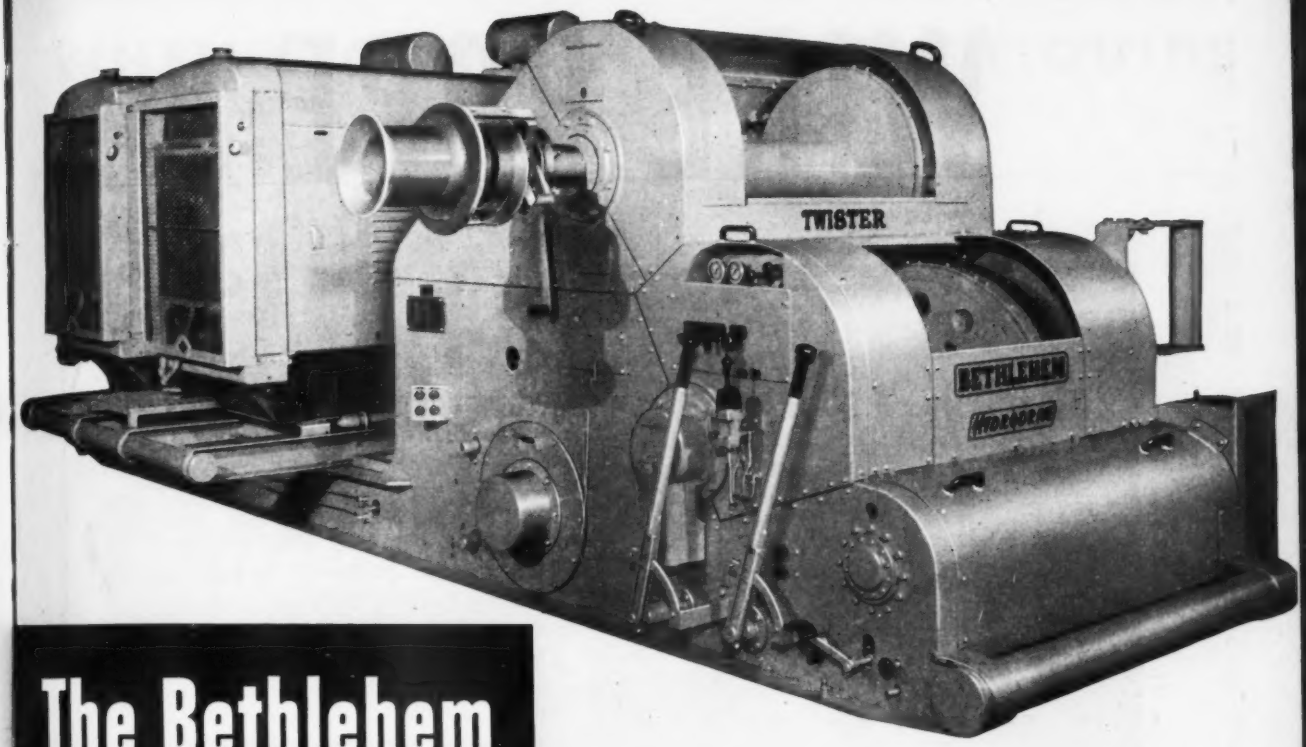
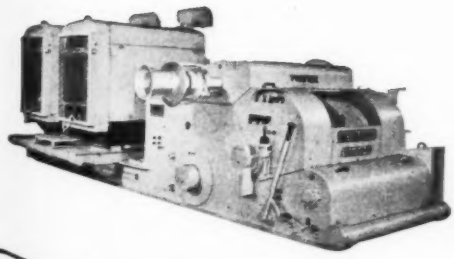


The Bethlehem TWISTER makes shock-loading obsolete



Shocks and jolts are out of style. In fact, with a Bethlehem Twister on the job, shock-loading of drill pipe and other working tools is virtually impossible.

The Twister (designed for depths ranging from 5000 to 7000 ft with 4½-in. pipe) is equipped with the Bethlehem Hydrodrive. This means:

Smooth, even flow of power—eager, responsive power

Greatly reduced maintenance on clutches, shafts, sprockets, chains, and other moving parts

Full range of drum speeds with minimum shifting

The Twister is now available with two- or three-engine sectionalized compound and pump drive powered through torque converters. The arrangement permits the compound shafts to be separated by gear-type clutches, assuring full speed range to the rotary drive. All engines may be compounded for hoisting.

Another important point: smooth controls. The Twister is entirely air-controlled, making the driller's job easier yet. For medium-depth drilling and deepest workover chores, the Twister tops them all—and field experience proves it.

Ask for full details. Complete information is available through any Bethlehem Supply office or store.

BETHLEHEM SUPPLY COMPANY

General Offices: 21 E. Second Street, Tulsa, Okla.

Subsidiary of Bethlehem Steel Corporation

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You get extras in Roebling Preformed Rope . . . extra toughness . . . extra life

YOU PAY FOR THE BEST when you buy wire rope. And you *get the best* when you buy Roebling Preformed "Blue Center" Steel Wire Rope. "Blue Center" steel is an exclusive Roebling product . . . gives rope the extra toughness that spells long life . . . service economy that really counts. Besides that, Roebling Preformed always spools better . . . reduces vibration and whipping . . . doesn't tend to set or kink.

Roebling makes a wide range of wire rope . . . brings you the right construction, grade and size for top performance and economy on each installation. Have your Roebling Field Man help select the *best* rope for your particular requirements. And for maximum savings, get his suggestions on the proper use and maintenance of wire rope. He knows the case histories of thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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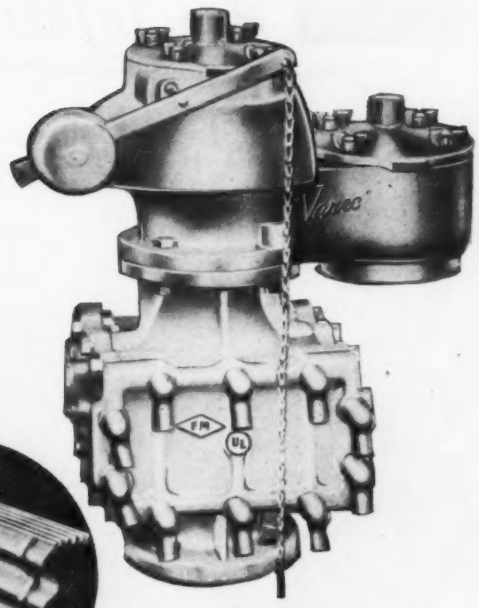
WHEN STORING FLAMMABLE LIQUIDS IT PAYS TO BE

EXTRA **Safe**

" WITH *Varec*" **FLAME ARRESTERS** in combination with your **VENT VALVES**



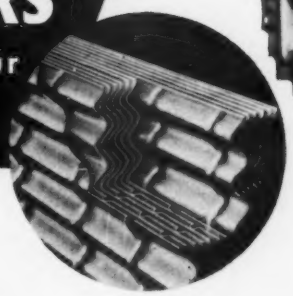


Fig. No. 5800A Conservation Vent unit consisting of "VAREC" Vent Valve in combination with VAREC Flame Arrester.

The belief that conservation vents or breather valves alone will prevent travel of flame back into flammable liquid storage tanks is questionable because of the many contributing factors. Careful authoritative analysis reveals that valves by themselves do provide *some protection* but this *"protection" is by no means adequate* under all circumstances.

Safety authorities emphatically advise that "vent valves are not regarded as providing the required protection against fire and explosion." A textbook on safety states that "a conservative policy is to provide flame arresters in conjunction with other vent equipment on all cone-roof atmospheric tanks handling oils with a flash point up to 200° F. open cup."

"VAREC" Flame Arresters when used as a unit with "VAREC" Vent Valves give you full fire protection at extremely low cost. Average installations run approximately .1 of 1% of your investment in tank and products. Consult your nearest "VAREC" representative or write for further information.

P-16

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Remember . . . "ABOUT 4000 WINCHES AGO . . ."

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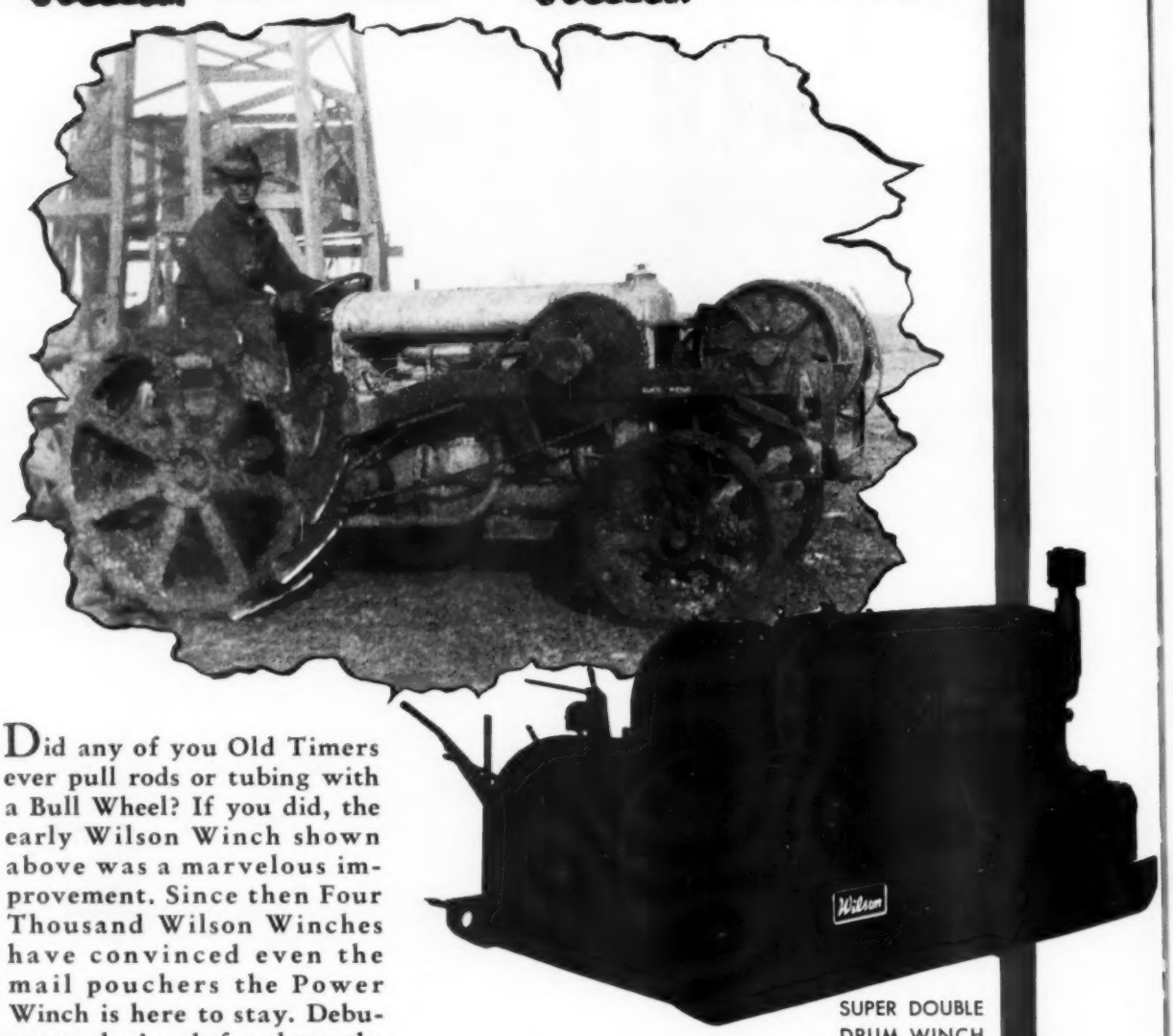

SUPER DOUBLE DRUM WINCH

Did any of you Old Timers ever pull rods or tubing with a Bull Wheel? If you did, the early Wilson Winch shown above was a marvelous improvement. Since then Four Thousand Wilson Winches have convinced even the mail pouchers the Power Winch is here to stay. Debutantes don't ask for them, the Roustabouts do!

Wilson ADVANCED ENGINEERING GIVES YOU . .

- Better design
- Lower operating cost
- Longer life
- Better performance
- Simpler and easier operation and maintenance

COMPARE QUALITY . . . COMPARE PRICES BEFORE YOU BUY!

Wilson MANUFACTURING CO., Inc.
WICHITA FALLS, TEXAS

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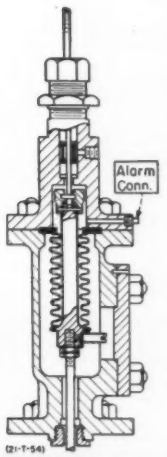
COMPARE

THIS FEATURE

OF THE HONEYWELL

SERIES "700"

VALVE



BELLOWS SEAL

Packless Bellows Seal provides protection against fluid leakage or air infiltration. Special construction eliminates buckle or twist, assures positive seal between its housing and bonnet. Tap, in housing, permits alarm connection. Unit is easily replaced in field. Available in Monel for pressures up to 300 lbs. or in stainless steel to 600 lbs. In addition, conventional stuffing box affords added safety.

Specially Designed Neoprene Diaphragm

Duplex Upper Stem Guide

Safety Stem Lubricator

One-Piece Bonnet

Wide Variety of Discs

Reversibility in the Field

✻ Compare the Bellows Seal of this valve with that of any other wide band proportional type. Look at it closely . . . study it feature by feature.

Then check the other features of the valve . . . the Specially Designed Diaphragm, the Duplex Stem Guide, the One-Piece Bonnet, the Safety Stem Lubricator, the wide variety of discs, the easy reversibility in the field.

Your comparison will prove that the Honeywell Series 700 has *all* the features you look for in a fine valve.

It's available in a wide range of styles and sizes. For detailed information, write for a copy of Bulletin 700-2, or call in your local Honeywell engineer . . . he is as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 1906 Windrim Ave., Philadelphia 44, Pa. Offices in more than 80 principal cities of the United States, Canada and throughout the world.

New Bulletin 750, "Control Valve Sizing Data" is now available

MINNEAPOLIS **Honeywell**

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HOW TO MEASURE AN ECONOMY

One way of gauging the might and vitality of the Southwest's growing economy is to measure its production of basic chemicals such as *chlorine* and *caustic soda*. On that score the Southwest leads every area in the U. S. in expansion of production facilities.

DIAMOND ALKALI, with its still growing Houston plant and its plant at Pine Bluff, Ark., is today a major producer of these chemicals in the Southwest. In oil production and refining, in the synthesis of petroleum-based chemicals and plastics and in the needs of many other industries, DIAMOND Chlorine and Caustic Soda play their part. The Southwest is growing and we are growing with it.

CONSULT DIAMOND FOR CHEMICALS:

Bicarbonate of soda
Carbon tetrachloride
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Chromates
Muriatic acid
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You'll go farther at lower cost per foot with IDEAL KELLYS & COLLARS

Your drill strings will be better balanced, will run smoother at all speeds with "Ideal" Kellys and "Ideal" Collars. Strain on machinery is reduced.

"Ideal" Kellys are smooth-running and true-balanced. They are concentric bored and accurately machined to provide the best weight distribution. They are forged from alloy steels to provide maximum resistance to torsional stresses and have ample strength to handle heavy drill strings.

You have your choice of "Ideal" Hexagon Kellys with precision-milled faces for maximum drive efficiency in the rotary, or "Ideal" Square Kellys with precision-forged faces. Both types have forged integral joints, machined inside and outside for perfect balance.

"Ideal" Drill Collars are also specially machined to assure concentric true bore and perfect balance.

Order "Ideal" Kellys and Collars from your National Supply store. They're available in the full range of A.P.I. sizes.

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NATIONAL OIL FIELD MACHINERY AND EQUIPMENT . . . SPANG PIPE . . . SUPERIOR & ATLAS ENGINES

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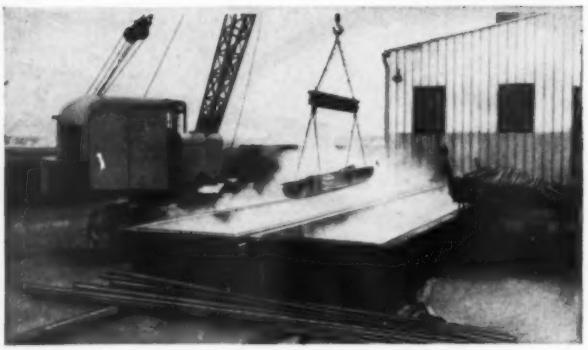
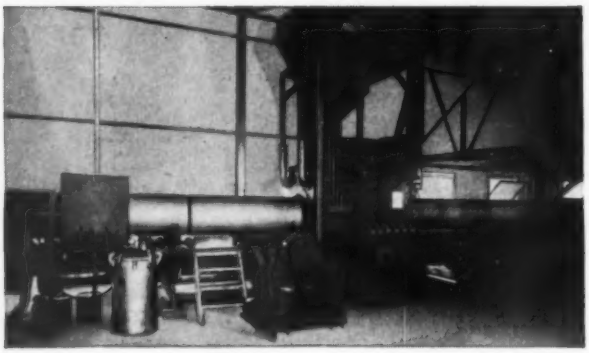
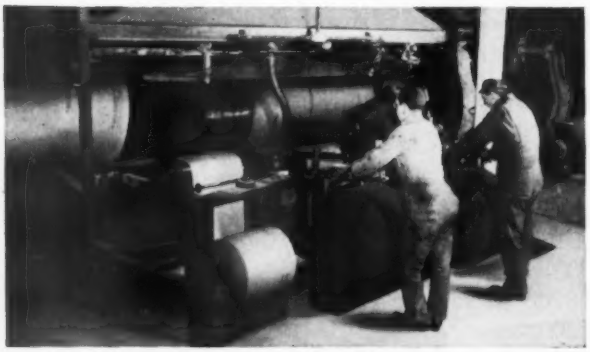


Pipe protected by HILL, HUBBELL is first dipped in hot caustic solution to remove cutting oil or grease, then rinsed in clear hot water.



After thorough drying at 90 F., pipe is cleaned down to the bare, bright metal by HILL, HUBBELL special Roto Grit Blast Process.



All coatings are doubly applied by flow-spreading and flooding. All HILL, HUBBELL wrappings are put on with perfect uniformity and positive bond.

When it's Out of Sight will it be Out of Mind?

It would be nice if you could bury pipe and forget it, with no maintenance costs to worry about.

That's the objective Hill, Hubbell is shooting at, and we have reason to believe we're closer to it than anyone else.

Careful control of every step in our pipe protection process means long, dependable service in the ground.

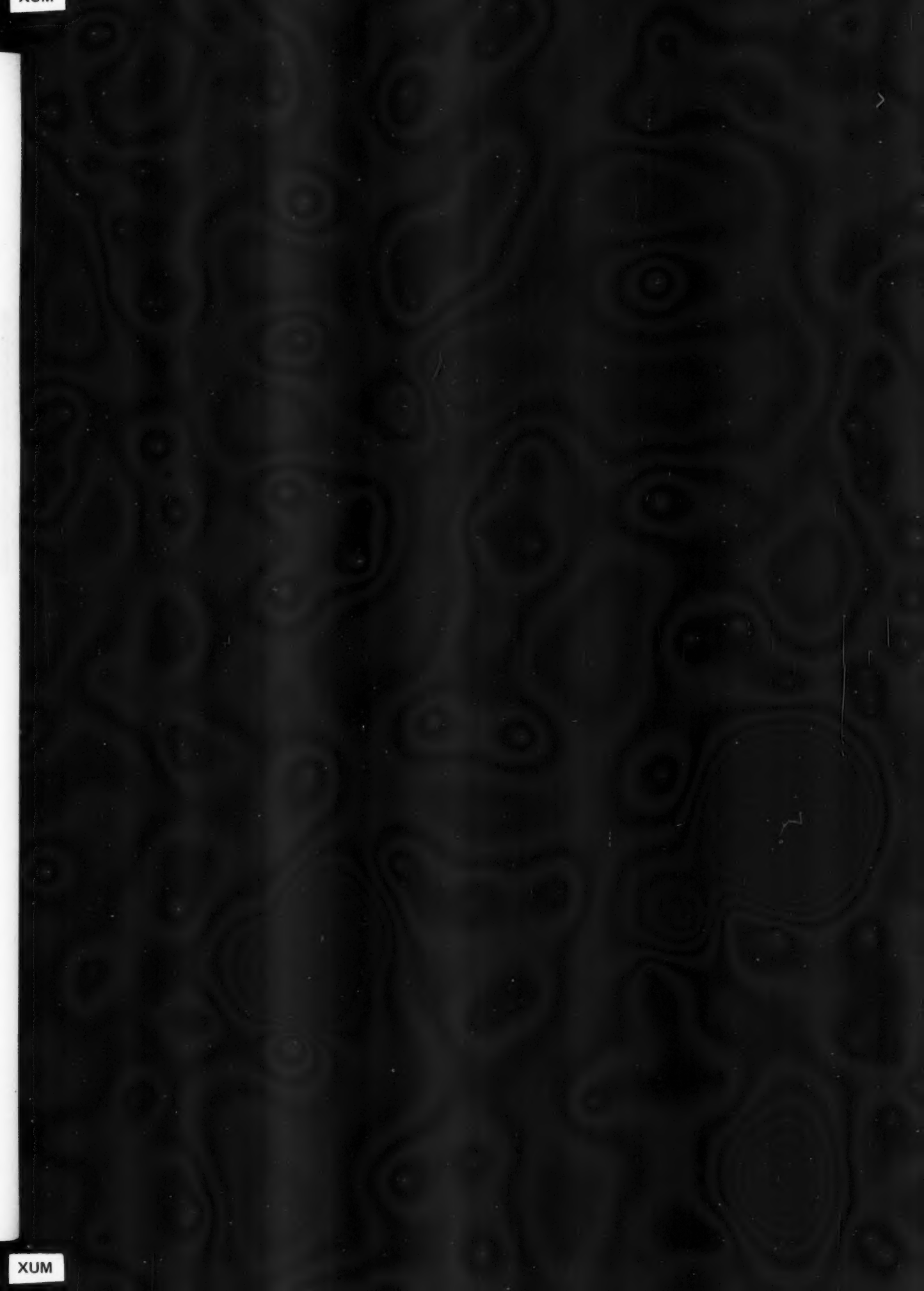
A quarter of a century of experience stands behind our work. With confidence, we place the Hill, Hubbell name on every length of pipe that leaves our plant.

Hill, Hubbell and Company

Division of GENERAL PAINT CORPORATION

Headquarters: 3091 Mayfield Road, Cleveland 18, Ohio

Leaders in Pipe Protection for a Quarter Century



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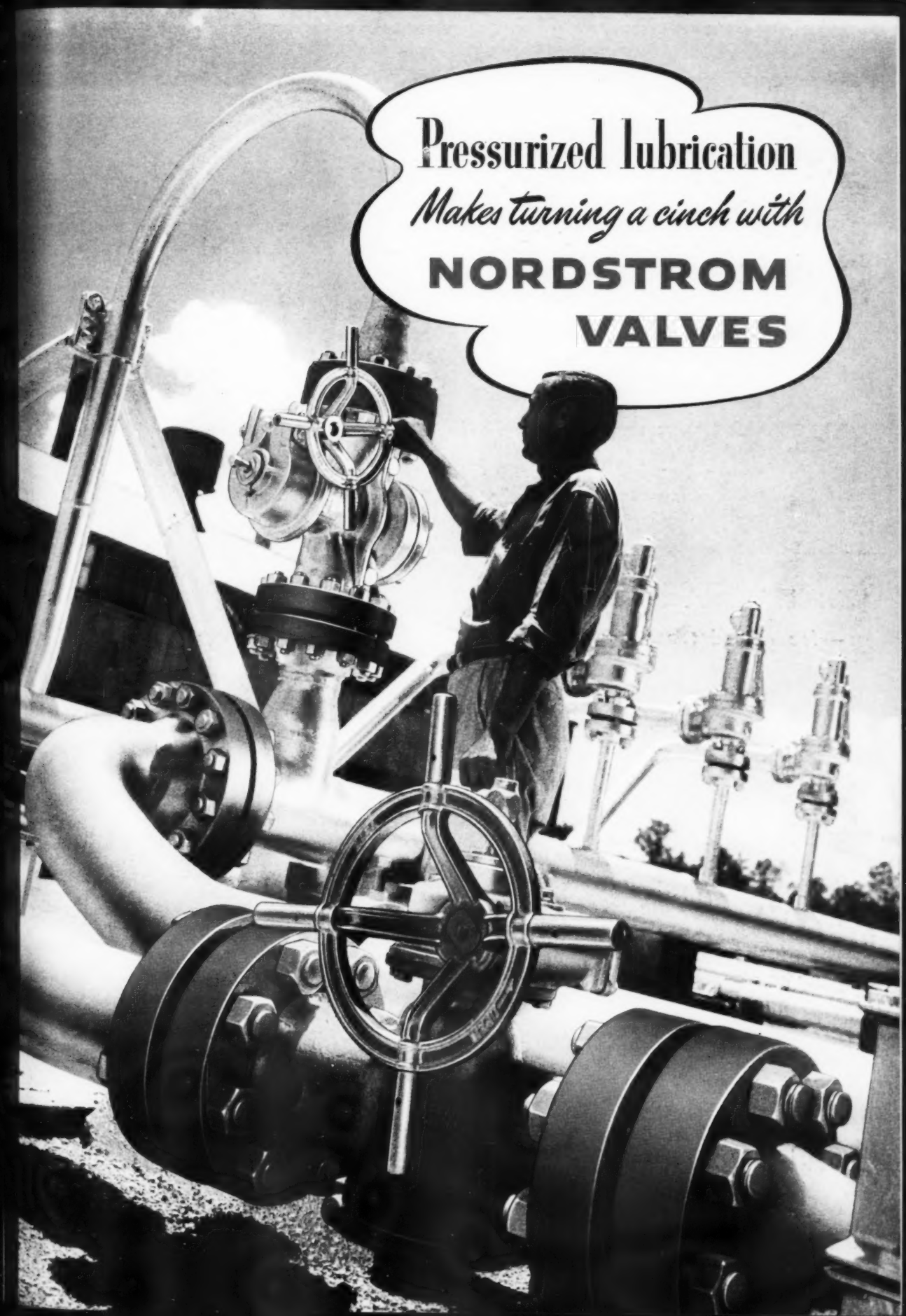
Pressurized lubrication
Makes turning a cinch with
NORDSTROM
VALVES

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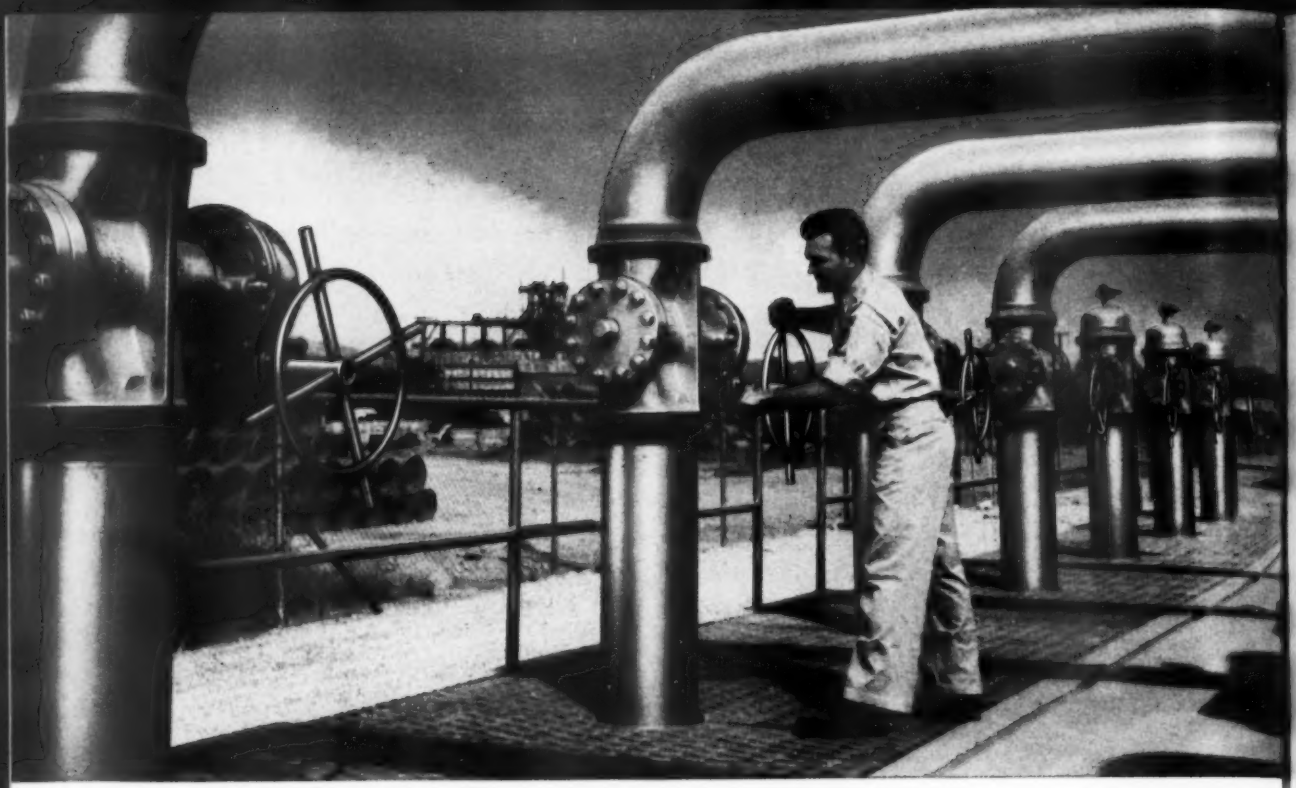
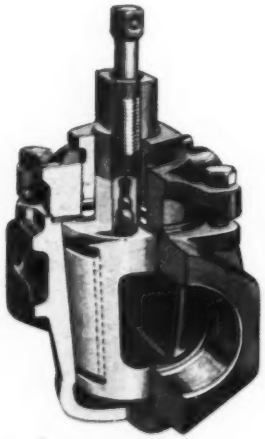


OU CAN GET THE **RIGHT** VALVE FOR THE *SPECIFIC SERVICE*

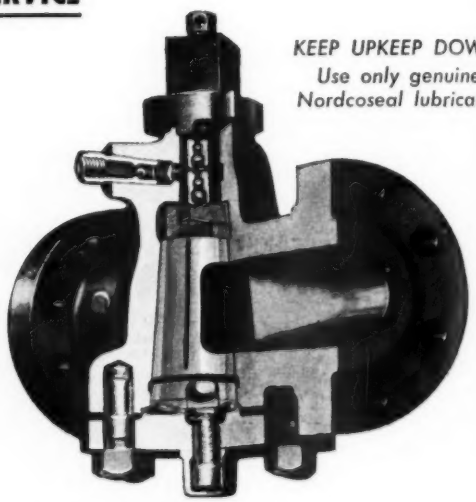
— from Nordstrom

KEEP UPKEEP DOWN
Use only genuine Nordcoseal lubricants

STANDARD TYPE, *Bolted Gland*



STANDARD TYPE, *Screwed Gland*



HYPRESEAL TYPE, *Bolted Bottom* **Cover**

Sizes ½" to 30"

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LUBRICATED VALVES

ROCKWELL

Sealdport Lubrication

NORDSTROM VALVE DIVISION— ***Rockwell Manufacturing Co.***— 400 No. Lexington Ave., Pittsburgh 8, Pa.

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Change Now to S/V Sovabead

The sooner you get these hard-working beads in your dehydrator, the sooner you'll get greater efficiency . . .

This new Sovabead team is ready now to give you all the benefits of a vastly improved desiccant for natural gas dehydrators.

Why wait until your present drying agent is completely inactive before you change?

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S/V Sovabead increases the capacity of your units (almost double). It maintains this capacity at high temperatures (as high as 120° F.) with low effluent dew point.

S/V Sovabead dries sour gas, with a longer bed life. It eliminates caking and reduces channeling, dusting and pressure drops in the bed.

Reactivation is quick, easy, and economical.

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Everything You Need in V-Belt Drives!

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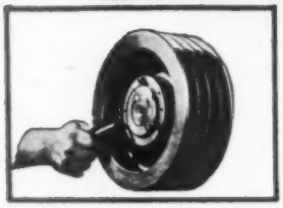
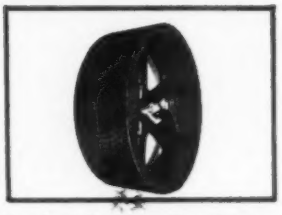
Greatest Name in V-Belt Drives

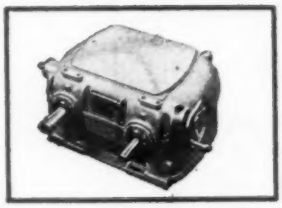
Made To Order Sheaves — These sheaves made with any number of grooves for A, B, C, D, or E belts, for applications up to 600 hp. Allis-Chalmers own foundry and machine shops equipped to handle work of any size.



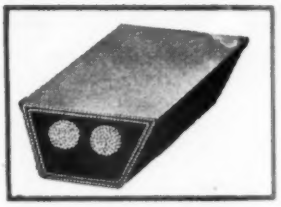
***Magic-Grip* Sheaves** — Fastest mounting sheave you can buy. Aligns easily . . . cannot shake loose. 1 to 12 grooves for A-B, B, C, and D belts. 1 to 250 hp. Stocked in many cities for immediate delivery.



Non-Stock Sheaves—These sheaves are made to order from stock patterns for A, B, C, D, or E belts, 1 to 1000 hp. For further information check with your *Texrope* drive dealer or Allis-Chalmers Sales Office.



***Vari-Pitch* Standard Sheaves** — Speed range of 9% to 28% on drives of 1 to 300 horsepower, using A, B, C, D, or E belts. Two to 10 grooves. These sheaves are available in either motion control or stationary control.



***Texrope Super-7* V-Belt**—Famous grommet construction. No splices where failure can start. Rubber cushion supports rayon cord at pitch line. Sizes and sections to suit all operating conditions. All Standard sizes from stock.

Get Expert Engineering Help

YOU CAN GET every V-belt drive component from the *Texrope* line: constant speed drives; standard and wide range *Vari-Pitch* drives; speed changers; motor bases; and new or replacement, long lasting *Super-7* V-belts.

In addition, you get extra engineering skill both in the field and factory that comes from having more industrial V-belt installations than any other manufacturer.

The world's greatest store of V-belt engineering knowledge has been condensed into a 120 page *Texrope* Pre-Engineered Drive Book. Covers 90% of all V-belt drive requirements. Ask your Allis-Chalmers Authorized Dealer or Sales Office for Bulletin 6956A, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3239

Sold . . .

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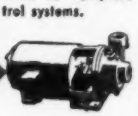
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

MOTORS — ½ to 25,000 hp and up. All types.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.



PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

Texrope, Super-7, Vari-Pitch, and *Magic-Grip* are Allis-Chalmers trademarks.

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It Pays to Use ALLOY STEELS!

In critical times, there's no time for "down-time." Machinery and tools *must* be able to stand the gaff of "round-the-clock" operation—or production of oil will fail to keep pace with national needs.

Now, more than ever before, vital parts of drilling equipment need the stamina of alloy steels.

Republic Alloy Steels are tougher and stronger than carbon steels. *Uniform* response to heat-treatment gives these rugged steels hard, wear-resisting surfaces around tough, fatigue-resisting cores. They offer high resistance to temperature extremes, corrosion, severe strain, shock and reversal of stress—all-around ability to stand up in deep drilling operations.

Yes, when machinery can't rest, alloy steels are best. They'll lessen the danger of costly breakdowns, and lengthen the time between parts replacement.

Republic—world's largest producer of alloy and stainless steels—offers its 3-Dimension Metallurgical Service to help you determine where these versatile steels can do a better job on your operation. Write, phone or wire today.

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Cut the cost of your oil field dirt moving jobs . . . use Bucyrus-Erie Bullgraders or Bulldozers. You'll find they'll whip through any dozing or grading job you've got, getting your exploration, drilling, and production off to a fast start. They're perfectly teamed with International crawler tractors for most efficient application of tractor power. That means outstanding speed, dependability, and durability — performance that makes them economy leaders on the lease.

See your International Industrial Tractor distributor for information on the complete line of Bucyrus-Erie hydraulic and cable Bullgraders and Bulldozers for International crawler tractors.

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YOU GET EQUIPMENT THAT CAN KEEP A SCHEDULE

"Rough going or soft bottom, FWD extra traction gets us where we want to go—and *safely*, whether the haul is over-the-highway or off-the-road—we'd rather drive an FWD."

YOU GET LOWER MAINTENANCE AND LONGER TRUCK LIFE

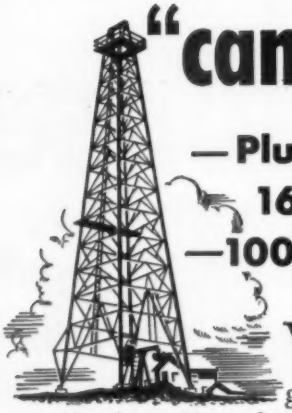
"FWDs proper distribution of load and power means less strain. Less strain means longer wear—fewer repairs. FWDs give us up to twice the life of ordinary trucks."

Here's a Light-Duty, TRUE Four Wheel Drive FOR GEOPHYSICAL WORK

You'll find that the new LD (light duty—14,500 lb. GVW) provides a firm safe mounting for drill rigs and geophysical instruments. It's a powerful, sure-to-get-there truck for hauling water or explosives, too. Ask for "The Story of the LD" plus facts on the complete FWD line. THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis. Canadian factory — Kitchener, Ont. *World-wide Sales and Service.*

America's Foremost Heavy-Duty Truck

Pump Barrels that "can take it"



—Plunger Travel Up to 160 Thousand Miles —100 Million Reversals

When oil men sink a pump a mile and more deep—it's got to be *tough* and *dependable*. *Tough* to withstand pressures up to 3 thousand pounds per square inch and shock loads of fifteen thousand pounds per square inch.

Dependable because at such depths there's no chance of maintenance. The only alternative is costly—pull up and replacement.

Globe Steel Tubes Company worked closely with the manufacturer of these OILMASTER pumps—developing the exact kind of alloy steel tubing to make these tough dependable oil well pump barrel units.

Globe fabricates these tubes to rigid specifications for the exacting conversion operations involved in producing a uniformly heat-treated and honed one-piece, long length barrel required for OILMASTER oil-well pumps.

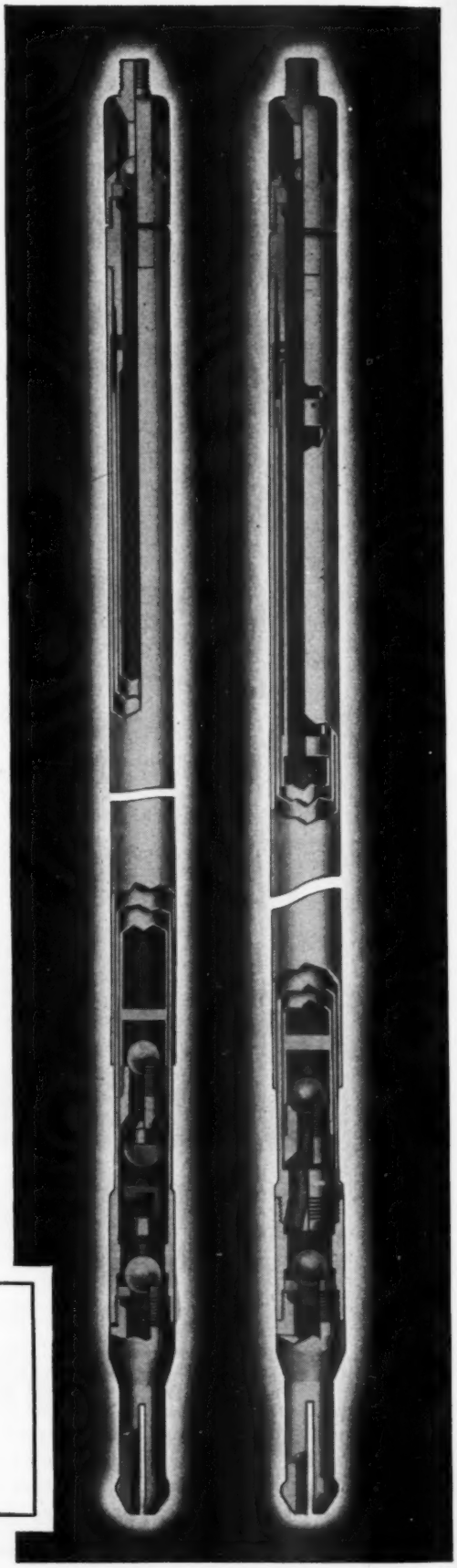
Result: *Users regularly report fifty million and more pumping cycles with no breakdowns!* The manufacturer, Fluid Packed Pump Company, simplifies production and gains a superior product.

Decide today to look into the possibilities of Globe Tubes for your products—to cut costs—to simplify production—to improve product design and performance. Write —

GLOBE STEEL TUBES CO.
Milwaukee 4, Wisconsin

Seamless Stainless Steel Tubes
Glowald Welded Stainless Steel Tubes
Carbon—Alloy—Seamless Steel Tubes
Globeiron Seamless High Purity Ingot Iron Tubes
Globe Welding Fittings

GLOBE
STEEL TUBES



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Convenience
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OILFIELD
EQUIPMENT
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ARE NOW
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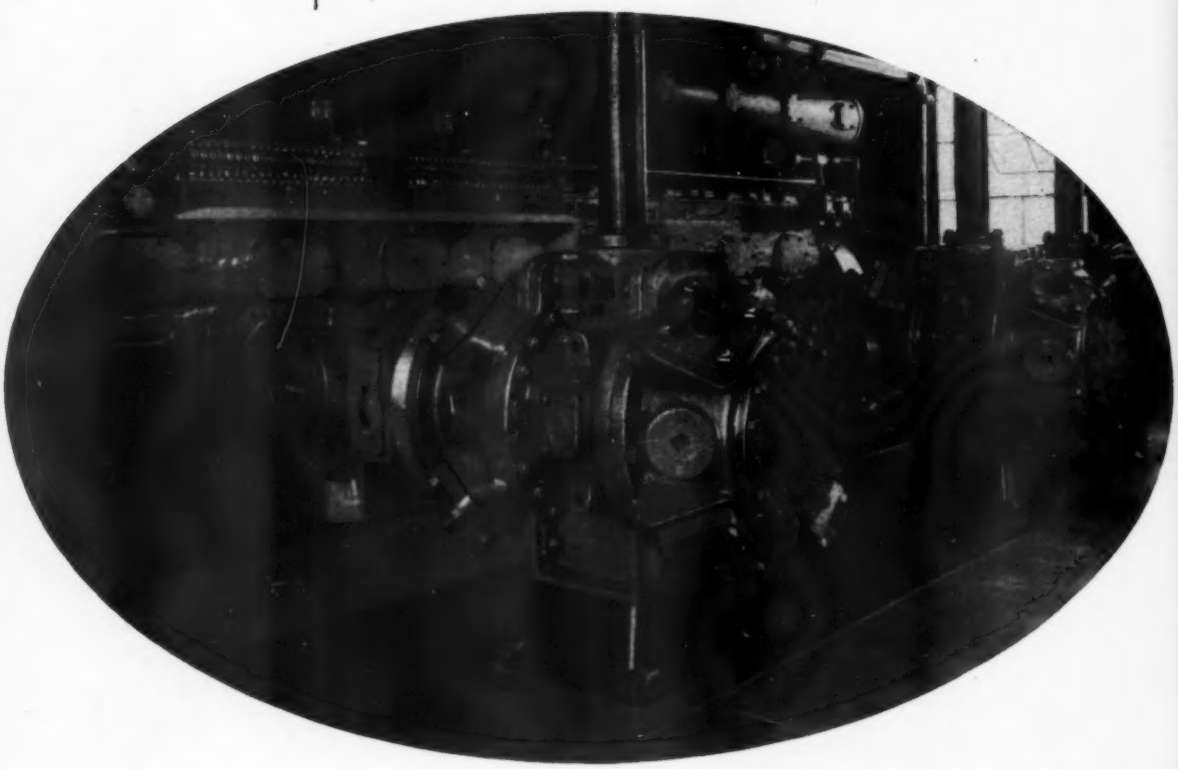
BOFEC (BRITISH OILFIELD EQUIPMENT CO.)

● British Oil Field Equipment Company of London, England has been licensed to manufacture Cameron Pressure-Operated Blowout Preventers, Drilling Control Equipment and Well Head Equipment, and has been appointed sales agent in the Sterling Area for Cameron products, including Lift-Plug Valves, Flex-Seal Valves, Weight Indicators, Pressure Gauges and Shear Relief Valves.

Inquiries may be directed to BOFEC, 32 Duke Street, St. James, London, SWI, England, or to Cameron Iron Works, Inc., 74 Trinity Place, New York, N. Y.

Insure dependable performance of pipe-line compressor units, reduce maintenance costs

with **Gulf Security Oil**



You make a two-way savings when your pipe-line compressor units are lubricated with Gulf Security Oil—lower maintenance costs, less out-of-service time.

Gulf Security Oil provides outstanding protection for bearings and cylinder walls in both engines and compressors. After years of operation with this quality lubricant, equipment shows remarkable freedom from cylinder wear and a minimum of carbon deposits on valves and rings.

Because of its excellent resistance to oxidation, Gulf Security Oil stands up for many hundreds of hours without appreciable change in its original properties. And because oil control rings are kept clean, oil consumption is remarkably low.

Many operators of units lubricated with Gulf Security Oil report that this quality oil insures more operating hours between overhauls and helps them avoid unscheduled shutdowns. And Gulf's delivery service is tailored to meet the needs of every pipe-line operator.

For complete information on Gulf Security Oil and for expert help on any lubrication problem, call in a Gulf Lubrication Engineer today. Write, wire, or phone your nearest Gulf office. Gulf Oil Corporation · Gulf Refining Company, Gulf Building, Pittsburgh 30, Pa.

FIFTY YEARS OF SERVICE
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THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION MEMBER

AXELSON FIRST CHO
FOR PETROLEUM
PUMPING
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You can argue quality at the surface but it's proved at the bottom of the well.

Axelson sucker rods and sucker r couplings offer a combination which assures top performance under all pumping conditions.

. . . ASK AN AXELSON EXPERT

XELSON MANUFACTURING CO. • PLANTS – Los Angeles 58; St. Louis 16 • OFFICES – ew York City 7; Tulsa 1; Buenos Aires, Argentina; Caracas, Venezuela • DISTRIBUTORS – Jones & Laughlin Supply Co.; Great Northern Tool & Supply Co.; Industrial Agencies, td., San Fernando, Trinidad, B.W.I.; Industrias Waldrip & Campbell, Barcelona and Maracaibo, Venezuela; Dominion Oil Field Supply Co., Ltd., Calgary, Canada; South merican Supply Co., Avenida Tacna 592, Lima, Peru.

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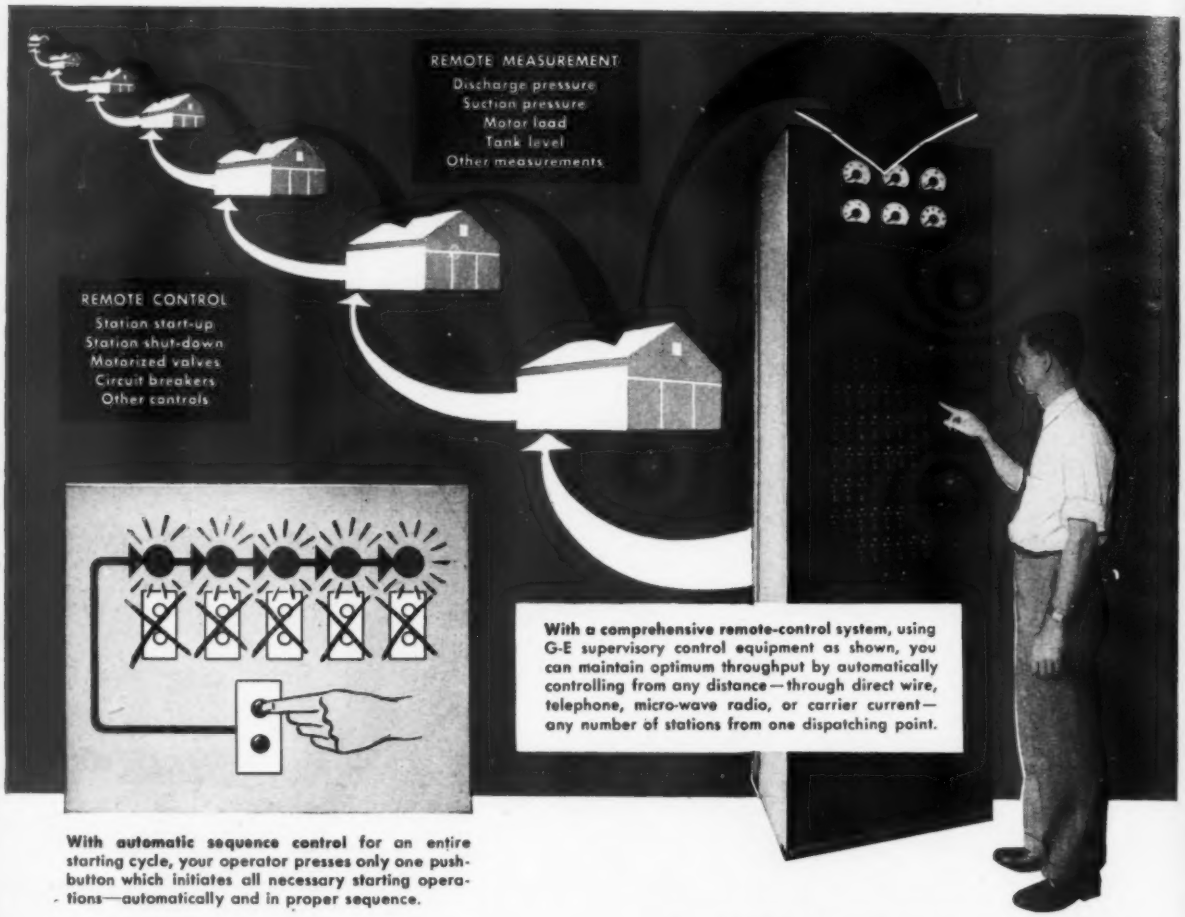
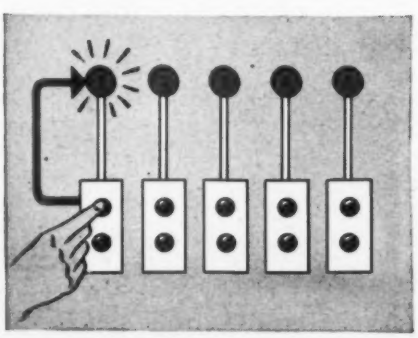
"GO AUTOMATIC" AS FAR AS YOU LIKE



With a comprehensive remote-control system, using G-E supervisory control equipment as shown, you can maintain optimum throughput by automatically controlling from any distance—through direct wire, telephone, micro-wave radio, or carrier current—any number of stations from one dispatching point.

With automatic sequence control for an entire starting cycle, your operator presses only one push-button which initiates all necessary starting operations—automatically and in proper sequence.



With convenient push-button operation, your operator controls individual motors from any desired location. Interlocking of control can take the responsibility for starting and stopping valve motors, blower motor, and main pump motor in proper succession.

...with AUTOMATIC G-E SYSTEMS

for all types of pipeline pumping control!

Automatic control of pipeline pumping—to any degree desired—can be easily, efficiently arranged with General Electric control equipment. You can provide it simply by using individual push-buttons to operate each motor in a main-pump starting cycle. You can go further and put an entire starting cycle under automatic single push-button sequence control, or employ instrumentation to make the station self-operating. You can also place your whole pipeline under remote control of your dispatcher with a comprehensive supervisory control system.

Automatic operation—saving manhours and increasing over-all efficiency—is only one of many ways G-E pipeline electrification can cut your costs. To electrify most efficiently and economically, **see your G-E representative first.** *General Electric Company, Schenectady 5, N. Y.*

Everything you need
to cut oil pipeline costs
—ELECTRICALLY!

GENERAL ELECTRIC

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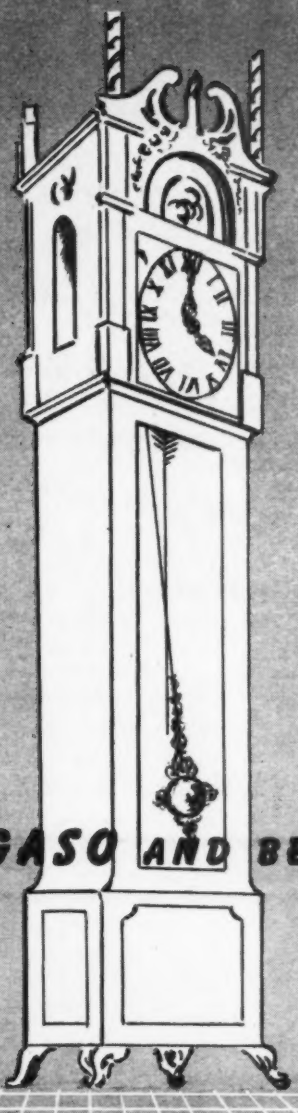

Old Age commands respect

Hundreds of "over-age" Gaso Pumps in the field tell a daily story of stamina—a story of pumps so dependable, so strong in every part, that they continue to function perfectly for almost unbelievable periods of time.

SAY GASO AND BE SURE!

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for every oil industry need

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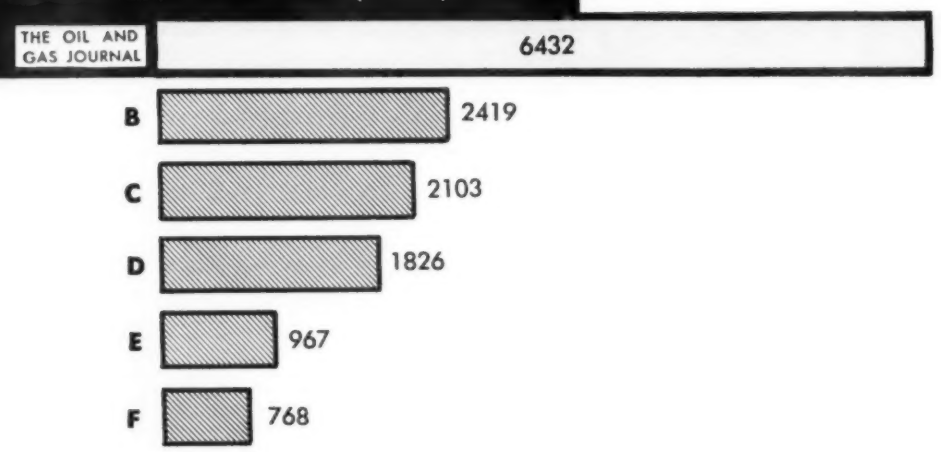
"follow the Journal— and you follow the Oil Industry!"

Only the Journal can assure its readers that its advertising pages are the most complete available. Journal readers have before them a great, continuous parade of new product information. Advertising is news!

ADVERTISING VOLUME FOR 1950:

(PAGES)



The Journal carries more advertising than the next three oil papers combined!

With this power house of advertising volume behind it, the Journal can do the things required of oil industry's "leading paper"—all of which add up to *benefits for readers.*

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News.....

THE JOURNAL IS THE LARGEST MAGAZINE IN THE WORLD FROM THE STANDPOINT OF ADVERTISING PAGES!

(Journal, 6,432 pages; Saturday Evening Post, 4,423 pages; Life, 3,814 pages, etc.)

THERE ARE TWO IMPORTANT REASONS WHY ADVERTISING VOLUME IS OF SIGNIFICANCE TO READERS OF OIL PUBLICATIONS:

1st. COMPLETENESS. Operating men must know that they know all about new equipment developments. Probably no other part of their job is more important. Many, many millions of dollars are spent yearly by oil equipment manufacturers to develop new or improved products which will help oil companies produce and refine more oil, more efficiently. They report the results of this research in the advertising pages of the Journal.

2nd. Without basic advertising revenue, a magazine in the fast moving, dynamic oil industry cannot hope to do the things required of the "leading publication." The Journal's editorial staff is about equal to the combined staffs of the next three oil papers. This staff is supported by numerous other correspondent reporters throughout the world—all for the purpose of producing the one magazine where oil men may keep informed.

TECHNICAL COVERAGE . . .

In addition to the Journal's exclusive news coverage, ONLY the Journal offers a complete single source for technical and operating developments in all operating segments of the industry . . . presented first and in fast tempo. About 40% of editorial space devoted to engineering articles is used for technical illustrations, charts, diagrams, maps, photographs, etc., all for the purpose of translating tedious narrative writing into the most modern type of technical art . . . attractively, effectively, and designed for easy reading.

NEWS COVERAGE . . .

ONLY the Journal, among all other oil publications, provides fresh, world-wide news and operating statistics. Being essentially a technical publication, with 87% of circulation to engineers and operating men, the Journal's news pages feature the unique technical-news approach for which it is famous. Monthly publications cannot even attempt to provide this very important service.

Note this trend

There are over 30 oil papers published, BUT BUSY OIL MEN haven't time to read 30 oil papers, or 20 oil papers, or 10, or 5 oil papers . . .

So more and more oil men are concentrating their valuable reading time in the leading oil paper, confident in the fact that when you . . .

"follow the Journal— you follow the Oil Industry!

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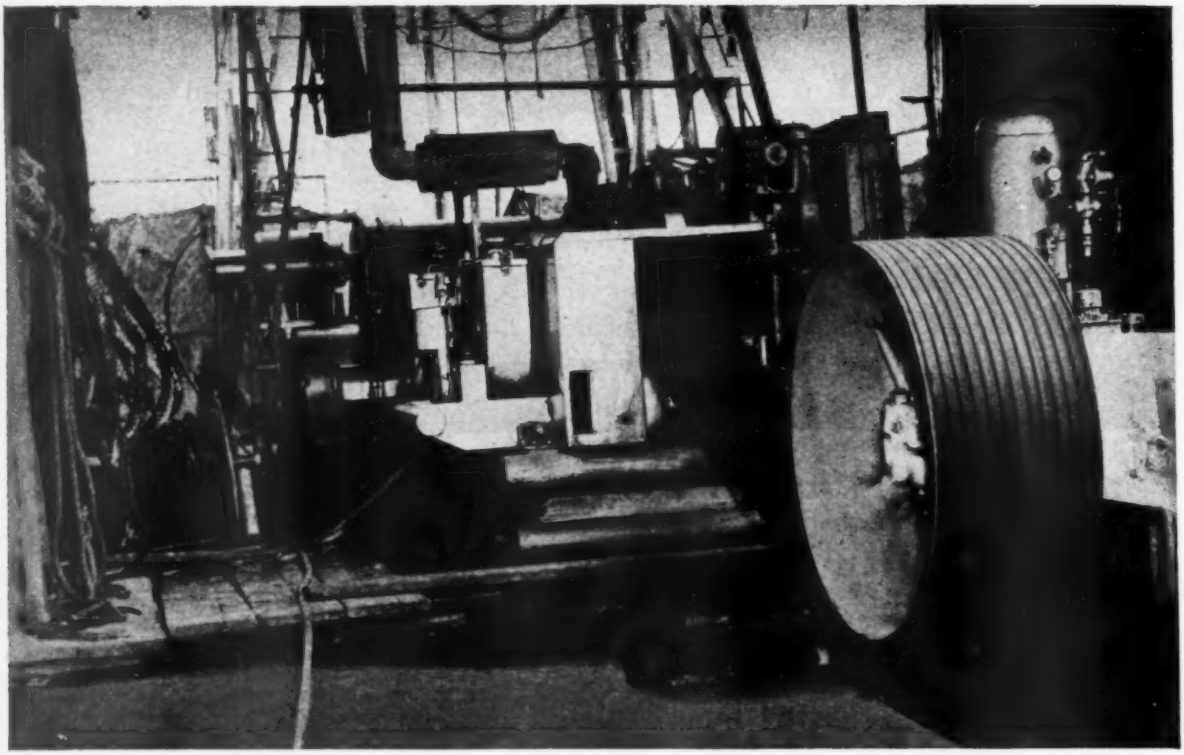

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Gilmer Multiple V-Belts

Gilmer V-Belts have the PULL! They're built for long, hard service on heavy-duty jobs. Maximum strength is provided by Rayon Pulling Cords, which are 25% stronger than old-style cotton cords, and processed for stretch control. They are locked in parallel, and individually cushioned *all around* with live rubber. Smooth flexing. Cool running.

Firm-gripping, too. This is assured by Gilmer Straight-wall construction. Belt hugs groove walls the full height and releases freely. Tough, multiple jackets resist wear and the hardships of oil field service.

Write for FREE copy of the Gilmer V-Belt Guide—a complete belt and sheave catalog containing much helpful engineering data.

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- ✓ full protection
- ✓ longest wearing
- ✓ field-proven rubber
- ✓ complete service in any oil field
- ✓ only PB can install 3 protectors per *stand* of drill pipe without breaking joints!

Protection is our Business...!

PIPE WIPERS

TRAVELING BLOCK BUMPERS

WIRE LINE GUIDES

MUD GUNS

PB OIL FIELD SPECIALTIES

Patterson-Ballagh

Division of Byron Jackson Co.

MAIN OFFICE: 1900 EAST 65TH STREET
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THE ANSWER

to better performance and lower costs in the operation of industrial engines!

It's higher speeds! Pioneered by Chrysler. Perfected by Chrysler.

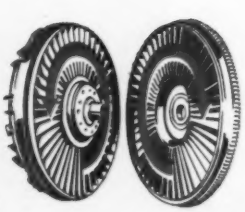
Today equipment manufacturers and users alike know you can have all the advantages of higher speed engines—*and lower costs, too.*

Famed Chrysler engineering and exhaustive research in higher alloy steels have produced a high speed engine that not only develops more power, more economically, but also costs *less* to operate and *less* to buy.

Chrysler Industrial Engines are at present helping to lower costs in over 50 different types of applications. A letter of inquiry will bring an engineer well qualified to discuss your requirements. Address

INDUSTRIAL ENGINE DIVISION, CHRYSLER CORPORATION, DETROIT 31, MICHIGAN

Chrysler Ind. 15—one of eight basic models.



CHRYSLER Gyrol FLUID DRIVE
Reduces Load Shock—Prevents Stalling!

Get longer, more trouble-free service from your equipment! Get smoother, faster, easier operation! Put a safety cushion of oil between power and load! Available on all models.

CHRYSLER

HORSEPOWER WITH A PEDIGREE

Award for Achievement . . . to a Westerner

Kaiser Steel is now one of the major pipeline suppliers to the western two-thirds of the nation—evidence that it has won its spurs in this basic industry.

The reasons for Kaiser Steel's remarkable growth are familiar to its customers—an integrated operation that assures highest quality; modern facilities producing a complete range of sizes; and a record for dependability unsurpassed in the industry.

Little wonder that experienced line men consistently rely on Kaiser Steel!

Kaiser Steel line pipe to conform to latest API specifications is produced in diameters from ½ inch to 30 inches, and in lengths up to 55 feet. Shipping points are Fontana and Napa, California.

It's good business to do business with

Kaiser Steel

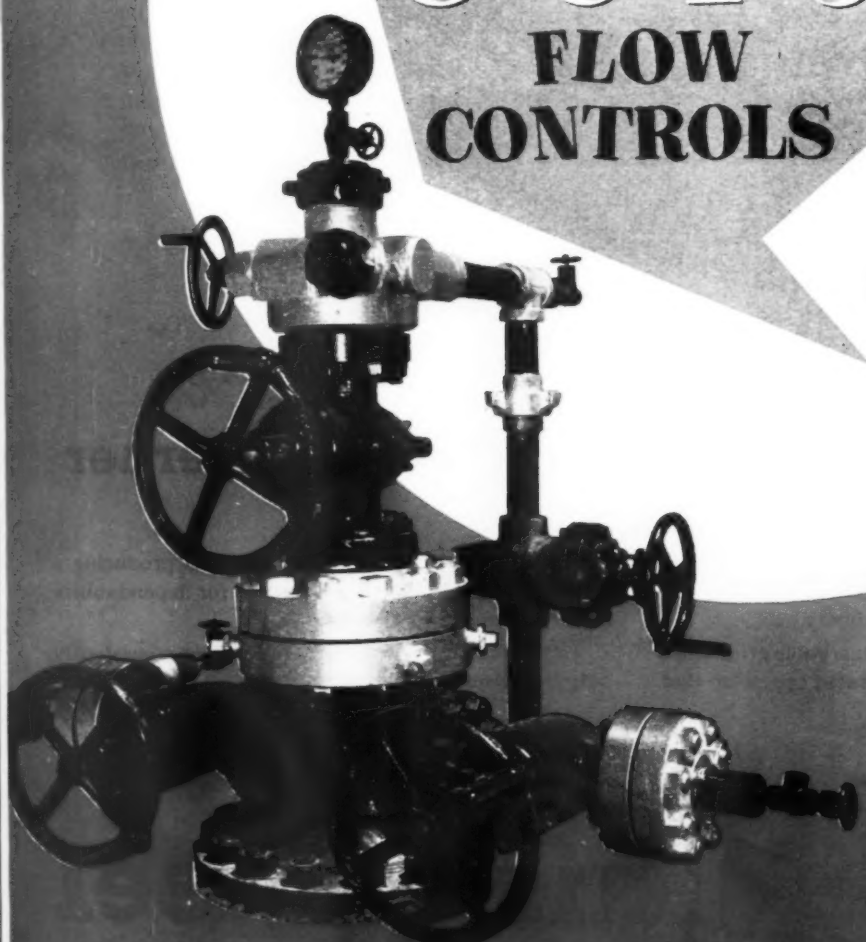
KAISER STEEL PIPE SPECIFICATIONS • All pipe manufactured to latest A.S.T.M. and A.P.I. specifications

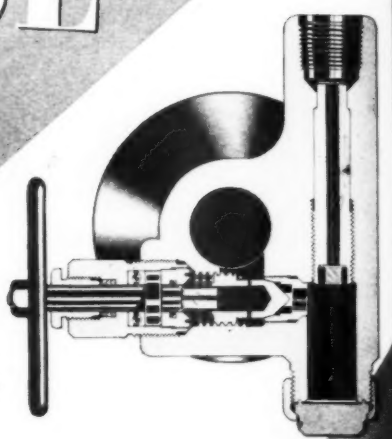
Type	Diameter	Length	Wall Thickness	Shipping Point
Continuous Weld—Threaded and Coupled	½" to 4" nominal I.D.	Uniform 21'	Standard	Fontana, Calif.
Continuous Weld—Plain End	2⅜" to 4½" O.D.	Up to 40'	Standard	Fontana, Calif.
Electric Resistance and Fusion Weld—Plain End	8⅝" to 20" O.D.	Up to 40'	.188" to .500"	Napa, Calif.—Basalt-Kaiser
Electric Resistance Weld—Plain End	5⅛" to 12¾" O.D.	Up to 55'	.188" to .400"	Fontana, Calif.
Electric Fusion Weld—Expanded—Plain End	22" to 30" O.D.	Up to 40'	.188" to .500"	Napa, Calif.—Basalt-Kaiser

Prompt, dependable delivery at competitive prices • KAISER STEEL CORPORATION Los Angeles, Oakland, Seattle, Portland, Houston, Tulsa, New York

FROM THE MASTER VALVE UP . . .

TOP YOUR TREES WITH O-C-T JE FLOW CONTROLS





There is good reason why O-C-T "JE" Flow Controls are now on nearly 4000 trees: in a single compact unit, the O-C-T "JE" Flow Control replaces a tee or cross, wing valve, choke and bottom hole test adapter. Besides, it eliminates three flange connections and effects cost and weight savings as high as 90%. It operates free and easy at high pressures . . . provides quick, easy field maintenance . . . is adaptable to either positive or adjustable chokes. So don't be handicapped by habit. Before you top your next tree, investigate all the advantages and tremendous savings this remarkable O-C-T "JE" Flow Control Unit offers you. Write today or see your O-C-T representative for details. All O-C-T equipment is available through recognized supply stores.

Here are actual prices!

2", 2½" and 3"
Series 600, 900 and 1500
"JE-1" $198.00
(complete with cap assembly)

2", 2½" and 3"
Series 600, 900 and 1500
"JE-2" $176.00
(less cap assembly)

Oil Center Tool Co.

P. O. Box 3091, Houston, Texas

Canada — Canadian-Vickers, Montreal, Canada

Sterling Areas — Le Grand, Sutcliff & Gell, Ltd., Southall, Middlesex, England. Address Export Inquiries for **All Other Countries** to P. O. Box 3091 Houston 1, Texas.

XUM

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High Man on the Totem Pole

From the origin of Twin Disc Clutches and Hydraulic Drives on the *drafting board* . . . into all stages of *manufacture* . . . prime consideration is given to the ultimate requirement of trouble-free service in the field.

All are rated conservatively to further assure minimum maintenance requirements.

But when downtime does become necessary, the man with the wrench in his hand can devote it to *repair* time and not *hunt-and-wait* time for replacement parts . . . because Twin Disc maintains *seven* factory-branch parts stations, plus 56 well-stocked and strategically located parts depots.

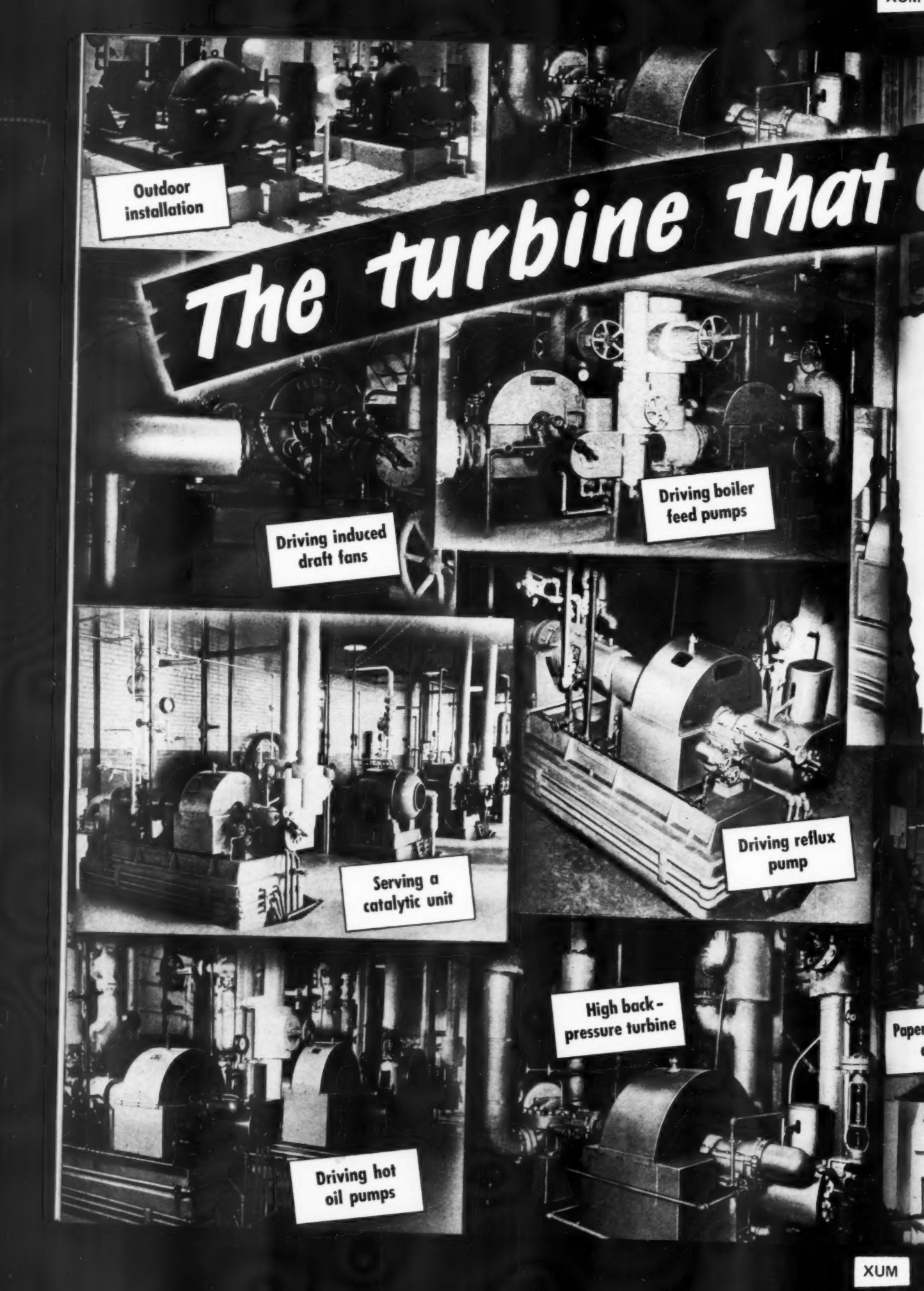
That's why, to be sure of performance—*and service*—always specify Twin Disc Clutches and Hydraulic Drives.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

Clutches & Hydraulic Drives

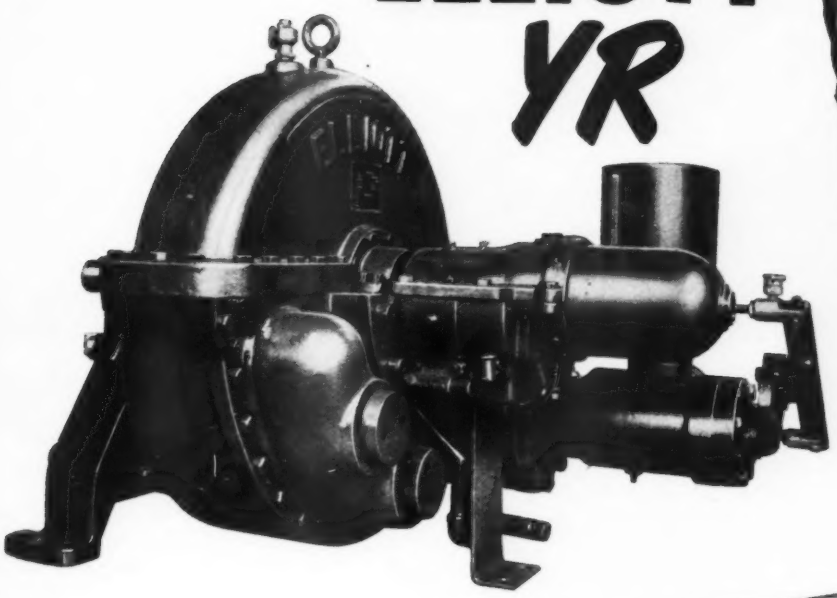
TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA


Outdoor installation
The turbine that
Driving induced draft fans
Driving boiler feed pumps
Serving a catalytic unit
Driving reflux pump
Driving hot oil pumps
High back-pressure turbine

t everyone likes...

ELLIOTT YR



Driving induced draft fans

Paper machine drives

Driving process pumps

YOU SEE THEM EVERYWHERE—in power plants, industrial and process plants, throughout the oil industry, in fact in all industries that demand reliability in mechanical drive turbines. Working indoors or out, under all kinds of conditions, operating condensing or noncondensing; sometimes operating on gas instead of steam. Although a standardized line of turbines, their flexibility results in a tailor-made unit for any type of application . . . And best of all, with the built-in dependability that lightens the load of the men whose job is to keep things running right.

Everyone likes the Elliott YR. The reasons are factually set forth in Bulletin H-16. Write for it.

ELLIOTT COMPANY

Steam Turbine Dept. • Jeannette, Pa.

Plants at: JEANNETTE, PA. • RIDGWAY, PA. • AMPERE, N. J. SPRINGFIELD, O. • NEWARK, N. J. • DISTRICT OFFICES IN PRINCIPAL CITIES

H-730

XUM

PRECISION TEAMWORK WINS!

Mission Silver Top Valve for Normal Pressures

"Stroke! . . . Stroke! . . . Stroke!" barks the coxswain. The men move in exact unison. The oars flash like a single mechanism. Precision teamwork **wins!** It is the same in slush pump operation. Piston, rod, liner, packing . . . must operate in perfect alignment, have perfect fit, work together with perfect mechanical precision.

The new MISSION "Super-Service" Liner . . . accurately bored, **induction** hardened to **uniform** case thickness, precision honed, and "Satin Finished" . . . now enables you to obtain the same top quality in liners that you obtain in MISSION Pistons, Rods, Packing, and Valves.

These products constitute a perfectly mated "team" . . . insure unmatched **economy,** in slush pump operation! Your supply store handles them . . . Mission Manufacturing Co., Houston, Texas. Export: 30 Rockefeller Plaza, New York. European Address: London, England.

Mission Super-Service Valve for High Pressures

"ROLLING DOG" SLIPS
TUBING SWABS
PLUG VALVES
CENTRIFUGAL PUMPS

Silver Anniversary MISSION MANUFACTURING CO. 1951

MISSION MANUFACTURING CO.

They Say—

"Oil Troubles the Waters"

"The unanimous vote of the Iranian Parliament to nationalize the Anglo-Iranian Oil Co. is due to the upsurge of violent nationalism which obsessed the fanatic who assassinated Prime Minister Ali Razmara. Less than 2 months ago the same deputies voted approval of the policy of the late prime minister, when he argued that Iran possesses neither the capital nor the technical skill to run the oil industry and needs the revenue to finance a program of industrial development and social reform.

"This about-face shows how volatile are the forces churning up in Iran; nationalist feeling has been worked up to fever pitch almost overnight. Evidently it was aggravated rather than allayed by a British note reminding Teheran that the oil company is operating under a concession that does not expire until 1993 and warning that the British Government must take all possible steps to protect legitimate British investments abroad. In this case, moreover, 53 per cent of the enterprise is owned by the British Government itself, and all that stands between the sudden and sweeping decision of the Majlis and the expropriation of the property is a month's adjournment of parliament followed by a 2-month study of methods to put the new law into effect.

"Much more is involved in this move than the desire of Iranian nationalists to rid the country of foreign interests and investments. This is one phase of the wave of xenophobia that is spreading all over the East and the Near East. . . ."

—*Editorial in the New York Times.*

More on Depletion

"I firmly believe it (a cut in the present 27½ per cent depletion allowance) would result in less revenue to the Government if enacted. I am certain it would jeopardize our oil supply for our defense efforts and for our petroleum-propelled civilian industry.

"Weaken the foundations of an industry, the supply of its raw material, and you weaken the entire industry.

"American companies have invested hundreds of millions in Near Eastern oil in the hope of having in that uncertain section of the world an oil reserve. But as the long threatening arm of communism reaches nearer the Middle Eastern oil fields, we realize that the only oil that is certain for national defense is that which we discover and produce within the United States itself.

"Modern wars are fought on wheels and in the air. Without adequate

FASTER.. ..MORE EFFECTIVE FIRE CONTROL

WITH THE ANSUL Stream Pattern

..plus BETTER HEAT-SHIELD PROTECTION

Exclusive Features

- Water-tight construction.
- Provides a modified cone-shaped stream pattern without hole in the center of the stream.
- Each nozzle gas pressure tested after assembly.
- Special spring loaded packing to insure lasting water-tightness.
- Designed for use by inexperienced operators.
- Low velocity, more effective stream of dry chemical.

Why Advertise the Nozzle! . . . .

. . . . because the nozzle on your ANSUL Dry Chemical Fire Extinguisher is water-tight . . . it won't become inoperative due to corrosion or caking of dry chemical within the working parts . . . the most inexperienced man in your plant can use the ANSUL extinguisher effectively . . . and only Ansul has a nozzle to meet all of these requirements!

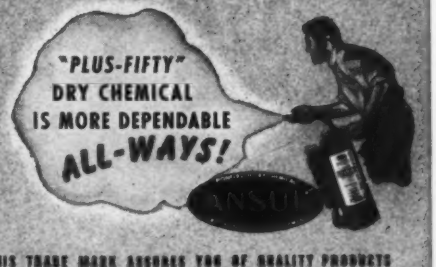
If your hazards require special long range straight stream nozzles, you can get Ansul Extinguishers equipped with these nozzles at no extra cost. With Ansul Dry Chemical Fire Extinguishing Equipment you have not only the best fire protection but also a choice of models and designs to meet your requirements.

Send for File No. 655. You will receive our latest catalog, a Periodic Inspection Record Chart, "Fundamentals of Fire Extinguishment" and information about Ansul Dry Chemical Piped Systems for automatic protection.

ANSUL CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION
MARINETTE • WISCONSIN

DISTRIBUTORS IN ALL PRINCIPAL CITIES IN THE U.S.A., CANADA AND OTHER COUNTRIES

"PLUS-FIFTY" DRY CHEMICAL IS MORE DEPENDABLE ALL-WAYS!



THIS TRADE MARK ASSURES YOU OF QUALITY PRODUCTS

Guiberson presents...

REVOLUTIONARY RESULTS

in

GAS LIFT

with

The Guiberson Type "A" Flow Valve

Guiberson gas lift equipment is protected by the following patents:

2,156,429	2,236,137	2,347,620
2,230,107	2,340,028	2,411,315
2,305,250	2,377,981	2,227,132
2,361,718	2,188,668	2,292,768
2,188,656	2,271,859	2,358,944

Other patents pending

NOW...FOR THE FIRST TIME...

THE VALVE THAT WILL PERFORM WITH EQUAL EFFICIENCY ON

either intermitting or continuous flow!

The Type "A" flow valve culminates more than 12 years of Guiberson experience in designing, making and installing gas lift valves and equipment. Years of field experience prove that radically improved performance can be expected from Guiberson Type "A" valve installations. It overcomes major gas lift problems that field men and engineers have heretofore accepted as unavoidable.

The Guiberson Type "A" Valve is a DUAL PURPOSE Valve.

Where well conditions or characteristics are such that an intermitting system is indicated, the Type "A" will produce the well economically and efficiently. It will also handle most effectively those wells that need to be produced by continuous flow. The equally successful use of this revolutionary valve in these heretofore separate fields of gas lift results in an enormous saving in first cost—and a simplification of replacement and repair inventory. The design of gas lift installations for either intermitting or continuous flow will be made by expert field service personnel of The Guiberson Corporation, regardless of location.

ALL THIS AND THE TYPE "A" COSTS LESS THAN ANY FLOW VALVE YOU'VE EVER USED!

A better valve at lower cost—and backed by BETTER SERVICE from Guiberson's trained staff of field men and engineers... every one capable of giving you real help in planning and installing gas lift systems and kicking the well off.

Ask your Guiberson representative for further details

BEFORE YOU INVEST

in any gas lift equipment—investigate the Guiberson Type "A." It's the most economical and best-performing flow valve made!

THE

GUIBERSON

CORPORATION

ESTABLISHED 1919 • DALLAS, TEXAS, U. S. A.

Sold By Leading Oil Field Supply Stores Everywhere

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XUM

Load 'Em and Move 'Em

With One Man, a Winch and a

HOBBS TRAILER

SELF-LOADING FLOAT

Tandems Rated at 50,000--75,000--100,000 lbs.
Single Axle Model with 30,000 lb. Rating

Load drawn on float by winch line after float has been lowered to ramp position and tractor backed against rear end of float.

After load is in place, tractor is returned to front and float is raised to hauling position by means of winch.

Loaded and ready to go. Entire job done by one man, Hobbs Self-Loading Float, and winch-equipped tractor.

When you have something heavy to move you can always call on your Hobbs Self-Loading Floats. Developed and engineered in the oil fields, this equipment is ideal for moving rigs, draw-works, butane tanks, other heavy and massive units, bulldozers, road building equipment. Hobbs Self-Loading Floats are famous for saving time and labor — for their super strength, easy loading, long service. Write, wire, telephone or cable HOBBS MFG. CO., FORT WORTH, TEXAS, for complete details. (Please mention this publication).

HOBBS MANUFACTURING COMPANY

FACTORY SALES AND SERVICE — Fort Worth, Houston, San Antonio, Lubbock, Texas. DISTRIBUTOR SALES AND SERVICE — Hobbs Trailer Equipment Co., Dallas, Texas; Hobbs Trailer Sales Co., El Paso, Texas; H & H Equipment Co., Okla. City, Okla.; Hobbs Trailer Co., Wichita, Kansas.

HOBBS TRAILER

OIL FIELD and COMBINATION Bodies

The "Utility Men" of the Oil Fields

Sturdy all-steel bodies decked with oak or steel plate, equipped with drill-pipe gin poles and extra heavy, rolling tail pipe. Oil Field Body has king pin for engaging inverted fifth wheel mounted on trailing equipment; Combination Body has new cable-released fifth wheel to engage standard king pins.

oil supplies, our modern war machine cannot move.

"To strike at our domestic oil supplies through an unwise change in the historic tax pattern can easily create an oil shortage."

—Sen. A. S. Mike Monroney of Oklahoma, before the House ways and means committee.

"It (the depletion allowance) has enabled the oil industry to expand to a point where it provides not only the low-priced gas that you use in your car and the fuel oil you use to heat your home, but it also has provided the vast quantities of petroleum products necessary to fight two world wars to successful conclusions. And this accomplishment has not resulted in excessive profits to stockholders.

"I am confident that no one of us here in Congress would willingly be a party to any legislative proposal which would even tend to hamstring this country in its defense efforts."

Rep. Toby Morris of Oklahoma, before the House ways and means committee.

"Uncertainties of Control"

"We are concerned with the proposals of Senate resolutions authorizing the Senate committee on interior and insular affairs to formulate an official national fuel policy.

"Various government agencies are supporting this legislation as is the coal industry which appears to believe that the ills of its industry can be cured by regulation of the free play of competitive forces and the end-use control of energy resources that will shift a greater portion of our fuel requirements from oil and natural gas to coal.

"Of course, we have always had a national fuel policy—a policy that relied on competition, individual initiative, and freedom of choice on the part of the consumer. Any system of monopolistic allocations of markets to fuels through government control and planning would inevitably have been less satisfactory and much more expensive to the consumer than the competitive system. Controls based on a fear of shortages would in themselves tend to bring about a shortage.

"The people of no other nation can buy and use petroleum products as generally, as easily, and as cheaply as in the United States.

"As we go into this emergency period we have the largest oil reserves we have ever had. At refineries we have much greater capacity, better tools, and more technical know-how than ever before, and we have made great strides in transportation and distribution.

"But we are faced with an unknown military demand for an unknown period. The physical uncertainties do not worry me because I have great confidence in the capacity of the petroleum industry to deliver the goods as long as it can maintain its

√RESEARCH

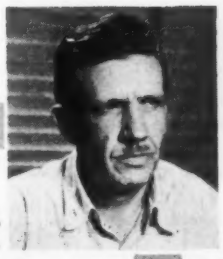
Continuing research in field and laboratory gives Independent's clients the benefit of the most advanced techniques and equipment . . . thoroughly proven.

√RESPONSIBILITY

Eighteen years of progress and client satisfaction give evidence of high professional standing and consistently reliable performance.

√REINTERPRETATION

Review interpretation service gives Independent's clients the extra value often available through experienced re-analysis of previously completed survey data.



F. M. Floyd, a key member of Independent's research staff, received his Electrical Engineering degree from Oklahoma University. Mr. Floyd's 23 years' experience servicing Independent's clients includes work in both field and laboratory.

Independent's record of service to a long list of important oil producers merits your confidence.

POINTING THE WAY IXC FOR THE DRILL

Independent EXPLORATION COMPANY

Geophysical Surveys

1973 WEST GRAY ★ HOUSTON, TEXAS

ESTABLISHED 1932

The New Cable-Tool Era

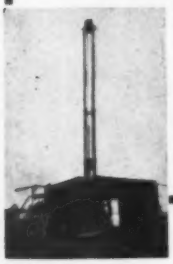
Oil men are among the quickest in the world to recognize, and accept, worthwhile change. During the five years since Walker-Neer Spudders first entered the field, the demand for them has skyrocketed. Today, it is the popular conviction, throughout the industry, that Walker-Neer Spudders are the finest ever built. 25 years' prior experience in the manufacture of cable-tool equipment is behind them.

Walker-Neer developments have practically eliminated spooling problems . . . enabled longer runs . . . freed the drilling motion from all solid jar . . . improved efficiency of controls . . . increased versatility . . . insured power and efficiency under adverse conditions . . . prolonged line life . . . and reduced maintenance expense to a new low.

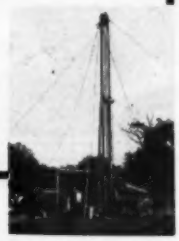
You don't have to travel far, generally, to observe a Walker-Neer Spudder in action; a few are pictured here. The location of one operating near you will be gladly furnished upon request. Write, also, for descriptive literature.

One of J. W. McKee's TWO Walker-Neer Spudders, an S-33, drilling top-to-bottom in Loco Hills, N. M.

WALKER-NEER
Has Set a New Standard
of Spudder Performance



C. M. Carter's S-32 Special, drilling top-to-bottom to 2800', Wallaceburg, Ontario.



Mor-Lee Drilling Co.'s S-32 Special, drilling top-to-bottom at 2800', Tulsa, Okla.

One of Abernethy Drilling Co.'s TWO Walker-Neer Spudders, a C-34, completing its 8th well to 4000', Crane, Tex.

Emerson & Waring's S-32, drilling top-to-bottom at 1800', Dunville, Ontario.

One of Buck Jones Drilling Co.'s THREE Walker-Neer Spudders operating in West Texas.

Layne-Hispano's TWO S-32 Specials in transit to Lima, Mex., for drilling 24" hole to 900'.

Two of Felipe de J. Avila's FIVE Walker-Neer WS-31's shipped to Monterrey, Mex.

Tidewater Associates' S-32 Special, pulling pipe and servicing old wells, Bradford, Penn.

One of Art Roach's FIVE Walker-Neer Spudders, an S-32, all working in Central Texas.

One of Carter Drilling Co.'s TWO C-33's, in transit to Great Bend, Kan., servicing at 4000'.

One of Gulf Oil Corp.'s TWO C-34's, wildcat test to 5800', Monahans, Tex.

One of Henry F. Parker's FOUR Walker-Neer Spudders, an S-32 Special, drilling top-to-bottom, McCamey, Tex.

Scott, Bell & Gault's S-33, in transit to Reed City, Mich., for drilling top-to-bottom to 4000'.

One of G. S. Taylor's THREE Walker-Neer Spudders, an S-32 Special, shipped to Snyder, Tex.

independence, as long as it can keep from being throttled by controls—so really what I fear is the uncertainties of control."

—Frank M. Porter, president, American Petroleum Institute, in an address at the Illinois Petroleum Marketers Association convention.

CALENDAR

April

American Chemical Society, 119th national meeting, Hotels Statler and Cleveland, Cleveland, April 8-12.

New York Oil Heating Association, Inc., Hotel Statler, New York, April 9.

American Petroleum Institute, lubrication committee, Division of Marketing, spring meeting, Book-Cadillac Hotel, Detroit, April 9-10.

Mid-West Regional Gas Sales Conference, Edgewater Beach Hotel, Chicago, April 9-11.

Michigan Petroleum Association, annual spring convention, Detroit Leland Hotel, Detroit, April 10-11.

Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, April 10-12.

American Institute of Electrical Engineers, District 4 meeting, McFadden-Deauville Hotel, Miami, April 11-13.

American Gas Association, distribution, motor vehicle, and corrosion conference, Hotel Peabody, Memphis, April 16-18.

American Society of Lubrication Engineers, annual convention and lubrication show, Bellevue-Stratford Hotel, Philadelphia, April 16-18.

Petroleum Industry Electrical Association and Petroleum Electric Supply Association, twenty-third annual joint conference, Hotel Adolphus, Dallas, April 17-19.

National Petroleum Association, Hotel Cleveland, Cleveland, April 18-20.

American Petroleum Institute, Rocky Mountain district spring meeting, Gladstone Hotel, Casper, Wyo., April 19-20.

Second Petroleum Recovery Conference, sponsored by Texas Petroleum Research Committee and petroleum-engineering department of Texas A. & M. College, College Station, April 19-20.

Florida-Georgia Gas Association, Hollywood Beach Hotel, Hollywood Beach, Fla., April 19-21.

Brussels International Fair, twenty-fifth annual event, Brussels, Belgium, April 21-May 6.

Southern Gas Association, Buena Vista and Edgewater Gulf hotels, Biloxi, Miss., April 23-25.

American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, Society of Exploration Geophysicists, joint annual meeting, Jefferson Hotel, St. Louis, April 23-26.

Indiana Independent Petroleum Association, spring convention, Oliver Hotel, South Bend, Ind., April 25-26.

Natural Gasoline Association of America, annual convention, Mayo Hotel, Tulsa, April 25-27.

Indiana Gas Association, French Lick Springs Hotel, French Lick, Ind., April 26-27.

Pacific Coast Research Conference, Berkeley, Calif., April 26-27.

Interstate Oil Compact Commission, spring meeting, La Fonda Hotel, Santa Fe, N. M., April 26-28.

American Gas Association, industrial and commercial gas section, industrial gas school, William Penn Hotel, Pittsburgh, April 29-May 4.

American Geophysical Union, thirty-second annual meeting, National Academy of Sciences, Washington, D. C., April 30-May 2.

American Petroleum Institute, division of refining, sixteenth mid-year meeting, Mayo Hotel, Tulsa, April 30-May 3.

Materials Handling Conference, International Amphitheatre, Chicago, April 30-May 4

SARAN LINED steel pipe

WHAT part of industry's six billion dollar corrosion bill are you paying? Any amount is too much and can be cut considerably through the installation of saran lined steel pipe. You will find, as have many of the country's leading manufacturers, that saran lined steel pipe means dependable, long term operation. In addition to the excellent corrosion resistance of this remarkable pipe—you have the plus values of rigidity, pressure strength and ease of installation, requiring NO special tools. These advantages are all important to you in the reduction of shut-down time, lost production and equipment replacement.

For full information, mail this coupon today to The Saran Lined Pipe Company Dept. MTSP-5111.

Distributed by

Saran Lined Pipe Company

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Offices in: New York • Boston • Pittsburgh • Tulsa
Philadelphia • Chicago • Portland • Indianapolis
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City_____

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SARAN LINED PIPE
DOW
product

Treat Cooling Water *with Chlorine* — the Proven Way

HELP MAINTAIN MAXIMUM PLANT EFFICIENCY . .

Hundreds of power plants and refineries have found chlorination by W&T the answer to heat exchanger slime problems. By eliminating slime forming microorganisms, maximum heat transfer is maintained in the condensers. The result — overall plant efficiency is kept at a maximum.

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American Institute of Electrical Engineers, District 1 meeting, Hotel Syracuse, Syracuse N. Y., May 2-4.

New York Oil Heating Association, Inc., Hotel Statler, New York, May 7.

American Gas Association, Natural-Gas Department, Dallas, May 7-8.

Independent Petroleum Association of America, mid-year directors' meeting, Cosmopolitan Hotel, Denver, May 7-8.

Gas Appliance Manufacturers Association, natural-gas department spring meeting, Dallas, May 7-9.

Liquefied Petroleum Gas Association, annual convention and trade show, Stevens Hotel, Chicago, May 7-10.

American Petroleum Institute, division of production, Pacific Coast district, spring meeting, Biltmore Hotel, Los Angeles, May 10-11.

Pennsylvanian Geology and Mineral Resources of Western Indiana, fifth annual field conference, sponsored by division of geology, Indiana Department of Conservation, and department of geology, Indiana University, Bloomington, Ind., May 11-13.

American Institute of Chemical Engineers, regional meeting, Hotel Muehlebach, Kansas City, May 13-16.

American Gas Association, operating section, production and chemical conference, Hotel New Yorker, New York City, May 14-16.

Pennsylvania Gas Association, Wernersville, Pa., May 15-17.

Pacific Coast Gas Association, annual transmission (technical) conference, Bakersfield, Calif., May 16-17.

American Institute of Electrical Engineers, District 5 meeting, Loraine Hotel, Madison, Wis., May 17-19.

Empire State Petroleum Association, Inc., Hotel Statler, Buffalo, N. Y., May 20-22.

Second annual John Zink Process Heating Seminar, John Zink Co., 4401 South Peoria Avenue, Tulsa, May 26.

American Petroleum Institute, division of marketing, mid-year meeting, Cincinnati, May 28-29.

Third World Petroleum Congress, Kurhaus, Scheveningen, the Netherlands, May 28-June 6.

American Petroleum Institute, standardization and standing committees, division of production, mid-year meeting, Brown Palace Hotel, Denver, May 28-June 1.

Institution of Gas Engineers, London, England, May 29-June 1.

Natural Gas and Petroleum Association of Canada, Royal Connaught Hotel, Hamilton, Ont., May 31-June 1.

June

Society of Automotive Engineers, Inc., summer meeting, French Lick Springs Hotel, French Lick, Ind., June 3-8.

New York Oil Heating Association, Inc., Hotel Statler, New York, June 4.

American Society of Mechanical Engineers, semiannual meeting, Toronto, Ont., Canada, June 11-15.

Pennsylvania Grade Crude Oil Association, 1951 annual meeting, Hotel William Penn, Pittsburgh, June 14-15.

Canadian Gas Association, Bigwin Inn, Lake of Bays, Ont., Canada, June 16-20.

American Society for Testing Materials, annual meeting, Atlantic City, N. J., June 18-22

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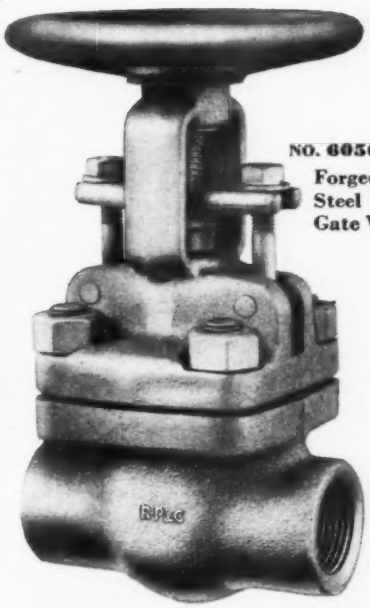

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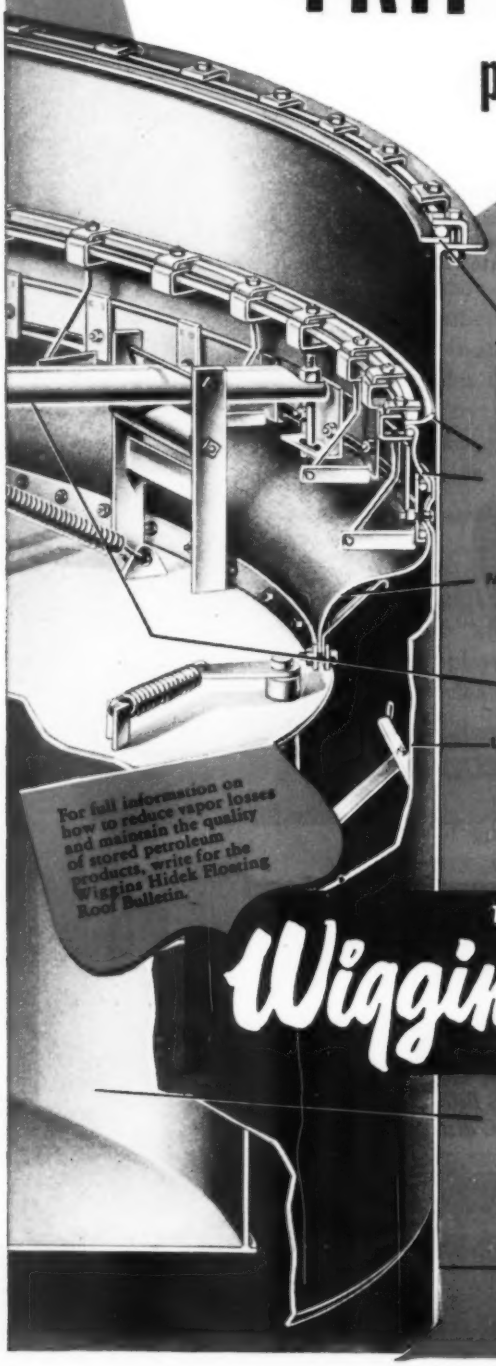

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JOURNALLY Speaking

Dispelling the Fog

WE are glad to note that scientific research has proved that the oil industry is not the cause of the smog which has been driving Los Angeles nuts in recent years. A little of it may come from refineries and many other industrial plants, but by far the major portion is produced by the Angelenos themselves through such innocent activities as burning trash and garbage.

Only a couple of years ago the public was blaming the oil industry for the whole thing, and politicians proposed to close down all refining in the area. This is typical of the way the oil industry is always made the goat for whatever goes wrong. A politician will propose an investigation of the oil industry at the drop of a hat—or introduce restrictive legislation and investigate later.

This has been going on for some 50 years despite the fact that the industry usually comes out of every investigation cleaner than the Los Angeles City Hall. The trouble has always been the same as it was in Los Angeles—the public is in a fog about the oil industry but most of the fog is created outside of the industry. The California oil men undertook to dispel the fog by analyzing the smog—a procedure which could well be applied to all instances of public misunderstanding of oil affairs.

Oil in History

THOSE few historians who have delved into the oil industry have been amazed at the lack of material available. The industry has done little to record its story and even less to tell it. School textbooks devote considerable space to the economic and social importance of gold mining, cotton raising, buffalo hunting, and other industries, but scarcely mention the petroleum industry or hint that anything good came from it.

The trouble is that most textbooks are written in libraries and their authors work from published source material. And there is precious little source material on the history of the oil industry and less of its influence on the course of American and world history.

We on the Journal found that out when we undertook to write a history of oil in the Southwest for our special Golden Anniversary Number which will be off the press in May. Our objective is a concise, fast-moving story of the development of all phases of the oil and gas industry, giving the high points in their relationship to each other and to the technological, economic, and political background of the times.

This would have been a relatively simple writing job had there been ample published source material from which to select names, dates, and events. But we couldn't find much ready reference material, either in our own library or the archives of oil companies or universities. So we had to do a vast amount of original research just to check details and chronology.

The thing that impressed us most in the course of this research was that the oil industry did a pretty poor job of public relations during most of its history. It kept its troubles and its triumphs to itself. It was always a political football, but the more it was kicked around the more it clammed up. At present the industry is telling its story, and future historians should have no excuse for ignoring it, but there is a gap of several decades in the reference sources.

We hope that our relatively brief 50-year sketch of southwestern oil will contribute toward putting oil into its proper perspective in history. We also hope that it will give all oil men a better appreciation of the importance of what they are doing now and what went before.

Social Security

EMPLOYES of the Interstate Oil Compact Commission have been placed under the provisions of the Social Security Act. What is needed now is an act to make the oil compact permanent instead of simply extending it for a couple of years, which would greatly enhance the social security of both the compact and the oil industry.

—Henry D. Ralph

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DUCTILE IRON is a cast ferrous product which combines the *process advantages* of cast iron with many of the *product advantages* of cast steel.

No longer in the pilot-plant stage, this new material is now produced and sold on the basis of specifications. Not only are its individual properties exceptional, but no other common engineering material provides such a combination of excellent castability and fluidity, with high strength, toughness, wear resistance, and machinability.

Actually, "ductile iron" denotes not a *single* product, but rather a family of ferrous materials characterized by graphite in the form of spheroids . . . a form controlled, in a broad sense, by small amounts of magnesium. Presence of spheroidal rather than flake graphite gives this new product a ductility that is unique among gray cast irons.

Four important types of ductile iron now being produced commercially are tabulated below.

REPRESENTATIVE MECHANICAL PROPERTIES OF COMMERCIAL HEATS OF DUCTILE IRON

	Grade	Tensile strength, psi	Yield strength, psi	Elongation per cent	BHN	Usual condition
A	90-65-02	95/105000	70/75000	2.5/5.5	225/265	As-cast
B	80-60-05	85/95000	65/70000	5.5/10.0	195/225	As-cast
C	60-45-15	65/75000	50/60000	17.0/23.0	140/180	Annealed
D	80-60-00	85/95000	65/75000	1.0/3.0	230/290	As-cast

A Pearlitic in structure. Provides good mechanical wear resistance.

B Pearlitic-ferritic in structure. Provides strength and toughness combined.

C A fully ferritic structure usually obtained by short anneal of either (A) or (B). Provides optimum machinability and maximum toughness.

D Higher phosphorous content than preceding grades, also higher manganese. Provides high strength and stiffness, but only moderate impact strength.

SOME UNIQUE PROPERTIES OF DUCTILE IRON

1. Its elastic modulus, about 25,000,000 psi, is virtually unaffected by composition or thickness . . .

2. It can provide a chilled, carbidic, abrasion-resistant surface supported by a tough ductile core. No other single material can combine these properties . . . its only counterpart being a tough material coated with a hard welded overlay.

3. As-cast ductile iron of 93,000 psi tensile strength has the same machinability rating as gray iron with a strength of 45,000 psi.

4. Annealed ductile iron can be machined at a rate 2 to 3 times that of good quality gray iron.

5. It can be satisfactorily welded.

APPLICATIONS

Automotive, agricultural implement, railroad and allied industries apply ductile iron, as-cast and heat treated, in components too numerous to detail.

Machinery, machine tools, crankshafts, pumps, compressors, valves and heavy industrial equipment such as rolls and rolling mill housings, utilize its high strength and rigidity.

In scores of engine, furnace and other parts serving at elevated temperatures, it provides oxidation and growth resistance heretofore unavailable in high carbon castings.

Other applications include paper, textile and electrical machinery, marine equipment, and pipe.

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Conservation Milestone

Another milestone in the checkered legal history of conservation was achieved last month when the Supreme Court of Oklahoma upheld the validity of the state's compulsory unitization law.

For more than 20 years, since the behavior of oil and gas in underground reservoirs came to be understood, leading petroleum engineers have agreed that the greatest ultimate recovery could be obtained by developing and operating a pool as a single unit. But general adoption of this technological ideal was hampered by many legal obstacles, chiefly diversity of surface ownership and lack of governmental authority to require unit operation and at the same time protect the equities of all interested parties.

On several occasions the federal Government sought to assert or assume this power, but each time the problem was passed back to the several oil-producing states. These states had to go through much trial and error to set aside the old common-law rule of capture and to substitute the police power and the law of correlative rights.

In Oklahoma and Texas, particularly, legislatures passed many laws and regulatory bodies issued many orders only to have them invalidated by the courts on one ground or another. But the forward-looking conservationists in the oil industry and in the state governments persevered in perfecting their methods, step by step. Gradually they established the legality of proration, of field and well allowables, of control of gas-oil ratios, of well-spacing rules, and of voluntary unit operation.

The big remaining step, in the minds of conservation engineers, was compulsory unitization where some lease and royalty owners refused to accept a plan for common operation of the underlying pool. The Oklahoma law was the first requiring field-wide unitization. Now this statute has survived its first serious judicial test.

Under this law the Oklahoma Corporation Commission may order all owners in a common source of oil and gas supply to follow a unitized program of management, operation, and development, under certain conditions to insure conservation and protect property rights.

In the case just decided this law was attacked on a variety of legal and engineering grounds, but the court held that none of these was sufficient to violate the state constitution. It affirmed that the police power of the state is adequate to accomplish the objective of compulsory unitization and that the methods used by the legislature and the commission met the tests of legality and administration.

This does not mean that the Oklahoma statute as now written is perfect. Refinements and improvements may be made here and in other states. But the principle of compulsory unitization is established and lawyers and engineers can now proceed to perfect its application.

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THIS WEEK

TUBULAR GOODS—PAD issues combined inventory-statement, requirements forms for drill pipe for third-quarter operations. . . . ¶Officials of PAD tell T.I.P.R.O. members that materials situation is going to get worse before it gets better because too little tubular goods is being produced to meet demand for the 43,000 wells approved by NPA. . . .

WASHINGTON—Five-man delegation from PAD to make tour of country to tell oil-defense-effort story to industry. . . . ¶PAD deluged by flood of "hardship" applications for relief from order limiting supply of TEL, takes dim view on industry's stockpiling program. . . . ¶Transaction involving sale of oil tankers becoming subject of major investigation by Congress. . . .

INDUSTRY—Authority of FPC to regulate independent producers, gatherers of natural gas moves toward first real test as hearings open in Bartlesville, Okla., on Phillips Petroleum case. . . . ¶Small refiner holds vital position in future mobilization plans, PAD official tells W.P.R.A. . . . ¶T.I.P.R.O. adopts resolutions calling for end of price discriminations on natural gas, but fails to go on record favoring state-wide minimum gas price. . . .

CANADA—Geophysical activity in Alberta reaches all-time high, with total of 107 geophysical crews working. . . . Western Canada's total number of crews reaches 118. . . . ¶Construction to start on main units of Canadian Oil Companies' refinery near Sarnia. . . . ¶Canadian Kellogg Co. gets contract for expansion of Imperial Oil's Sarnia plant. . . .

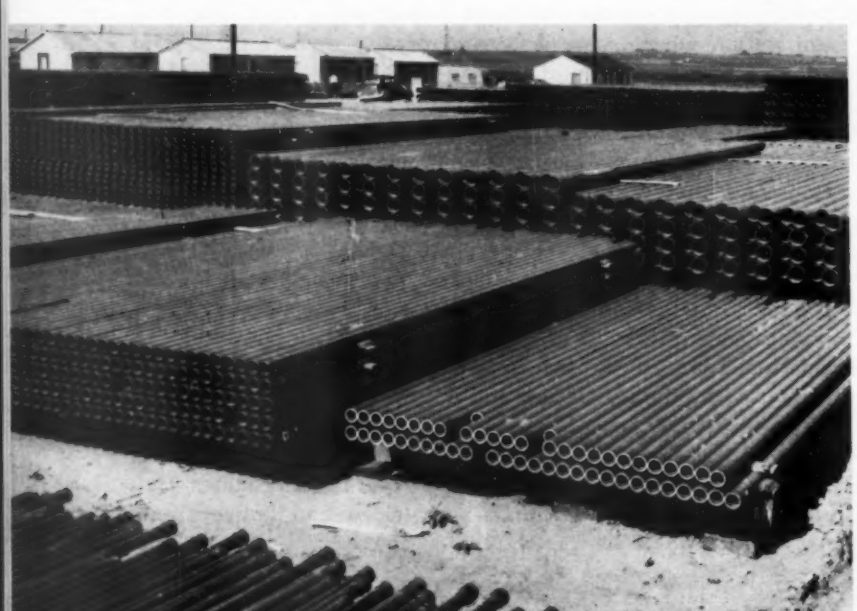
ACTIVITY—Crude production averaged 5,968,300 bbl. daily for week ended March 31, up 5,325 bbl. daily for the week. . . . ¶Total well completions decreased to 673 for the week from 747 the previous week. . . . Wildcat completions totaled 140, compared with 164 a week earlier and 131 for same week last year. . . . ¶Rotary rigs operating in United States increased 84 rigs to 2,251, the greatest number since the first of the year. . . .

TRENDS—Production of crude and field condensate for April is estimated at 6,140,000 bbl. daily, based on trends and announced allowables. . . . ¶Light-product output and total imports will bring new supply for the month to about 7,630,000 bbl. daily. . . . ¶If total demand averages 7,300,000 bbl. daily, crude and product inventories will increase about 10,000,000 bbl. during the month. . . .

PRODUCTION—Gas-injection operations at Northeast Elmore pool of Oklahoma scheduled to go in operation by July 1. . . . ¶Offer of operators comprising Coalinga Nose unit operation in California to buy Universal Consolidated's properties is clarified. . . . ¶Bids to be opened April 16 for purchase of Navy's share of crude from Stevens zone in Elk Hills Naval Oil Reserve. . . .

INTERNATIONAL—Reduction of living allowances, oil-nationalization decision result in strikes by Iranian oil workers. . . . Martial law extended to several areas. . . . ¶Deterioration of oil industry in Romania reflected by disclosure that military has taken control of oil fields. . . . ¶Kellogg gets contract to construct coal-to-gasoline synthesis plant in South Africa. . . .

NATURAL GAS—Deliveries of gas by Transcontinental to reach 505,000,000 cu. ft. by middle of next month. . . . Requirements of company's system estimated at 4,200 billion cubic feet over 20-year period. . . .



PIPE LINES—Tennessee Gas Transmission plans to lay 491 miles of 26-30-in. line parallel to its existing system in Texas, Louisiana, Mississippi, Tennessee, and Kentucky, and extend artery 303 miles to serve New England this year. . . . ¶United Gas Pipe Line lets $25,000,000 contract for 1,000 miles of line to Gulf Southern Contractors. . . .

NOT ENOUGH.—While PAD distributes its new combined inventory-statement and requirements application for drill pipe for third-quarter operations, numerous complaints are being voiced that no tubular goods are available. PAD officials say the shortage will get worse before it gets better, because steel mills aren't producing enough to meet the demand for the 43,000 wells approved by NPA.

New Materials Form

PAD issues combined inventory-statement, requirements application for drill pipe for third-quarter operations

Bertram F. Linz

WASHINGTON. — A combined inventory - statement and requirements application for drill pipe for third-quarter operations is being distributed to operators and drilling contractors by PAD.

Full disclosures will be required of existing inventories of both new and used pipe, both idle and active strings, in stock, in transit, or on hand anywhere, together with a use history.

The service record calls for data in both feet and tons, separately for 4-in. o.d. and larger and smaller than 4-in. o.d. and for Grade "D" or lower and Grade "E" or higher, from zero to 50,000 ft. of hole, 50,000 to 100,000 ft. of hole, and over 100,000 ft. of hole, and a report on new drill pipe, in both feet and tons, bought last year.

Rotary rigs.—The questionnaire also calls for information, by districts, on the maximum number of rotary rigs operated last year, number now operating, number stacked which are operable, and the number the operator plans to acquire during the current and following three quarters, together with the approximate number of feet of hole drilled during the past 12 months.

Following his report on inventory the applicant may present his needs for drill pipe in tons for each of the two grade classifications, reporting the grade and footage of each size and weight required, and showing the minimum inventory footage required for continuous operations.

Certification.—In submitting the report, on Form PAD-17-DP, the applicant is required to certify that the material sought is for his own use as an operator of a wholly or jointly owned oil or gas property or enterprise; receipt of the material will not cause his inventory to exceed a minimum practicable working inventory at the end of the quarter, and that the material will be used in drilling, completing, or reworking exploratory or field wells in accordance with the rules and regulations of the state-regulatory bodies and in accordance with the rules and regulations of NPA Order M-46 and of PAD.

With the materials situation steadily deteriorating with no indication that it will improve in the reasonably near future, PAD is giving much thought to measures designed to prevent black marketing of pipe, by requiring the submission by operators of either electric logs, cement reports, or state certificates of completion.

Total control. — Their concern over this problem is good evidence of their belief that it will be necessary to control the use of every foot of pipe if the 1951 target of 43,400 wells is to be hit, but the equipment situation is equally serious and NPA is finding it increasingly difficult to secure supplies requested by PAD to meet emergency applications.

"Hardship" Deluge

Dim view taken by PAD on TEL-stockpiling program

WASHINGTON. — Deluged by a flood of "hardship" applications for relief from the order limiting refiners' supplies of tetraethyl lead, PAD officials are taking a dim view of the way the industry is accommodating itself to the TEL-stockpiling program.

Several officials told The Oil and Gas Journal this week that "come hell or high water" the vitally needed stockpile is going to be built, regardless of what happens to octane values.

To be screened.—They made it clear that these "hardship" applications will be screened with very critical eye, and while no refiner will be left to go out of business because of lack of TEL most of the applications will be turned down. Only such cases as those of a company whose production was curtailed because of a strike during the base period or refiners who for good reason desperately need tetraethyl lead will get relief; applicants seeking additional supplies to "keep up with the Joneses" among their competitors will not be successful.

Officials explained that many of the applications are based on the ground that demand has increased greatly over last year. But, they said, a 10 per cent increase was taken into consideration in fixing the TEL quota at 80 per cent of the base period, instead of making it 75 per cent and then granting 5 per cent more to take care of the additional demand. Currently, demand is up more than half again that 10 per cent, they conceded, but it is not expected that requirements for the year as a whole will be much above that figure.

Octane cut.—To meet the situation, it was said, refiners should have reduced the octane content of their motor gasoline by 1½ points, but while a few have done this the majority have made cuts of only one-half to 1 point, and that is one reason why some are in trouble.

Another factor which is causing trouble is the authority given in the curtailment order for refiners to use as much as 30 per cent of their year's allocation in any quarter. Some refiners, it was said, appear to believe this provision, designed to permit them to meet seasonal peaks, was a permission to use 30 per cent in each of three successive quarters and then come in for an additional quota to pad out the fourth quarter, which definitely will not be permitted.

As a matter of fact, it was admitted at PAD, octane values probably cannot be kept even at the 1½ points under former levels which should be the present average and are quite likely to be forced down as much as 2 points more as time goes on.

Supply. — The TEL-supply situation, it was disclosed, is far from satisfactory. Production is slipping, and although Ethyl Corp. reported its March output was at a peak level, E. I. du Pont de Nemours & Co., Inc., output fell off substantially.

The cause of this situation is the growing shortage of base stocks, such as sodium and ethyl chloride, the former also extensively used in the manufacture of detergents and the latter in the making of plastics, both vital products. The National Production Authority is working in an effort to increase the production of these items, but there is some question how far and how quickly this can be done.

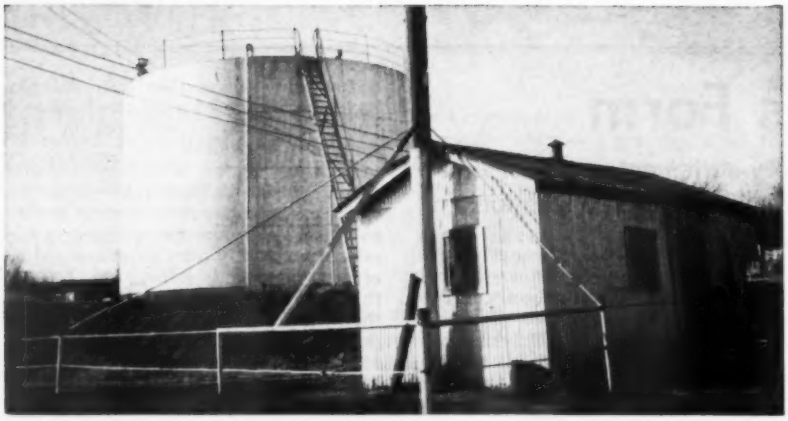
Meanwhile, it is pointed out, the expanded capacity for production of TEL will take a long time to develop and it lacks the back-up capacity of base materials to support operations. Also, the additional demand created by the increased use of TEL in military-aviation gasoline is putting a great strain on present facilities, it was said.

Tanker Deal

Transaction is subject of major investigation

WASHINGTON.—A tanker deal in which a former member of Congress was a party has become the subject of a major investigation and a Senate banking subcommittee, headed by Sen. J. William Fulbright of Arkansas is now attempting to develop its details.

Meanwhile, the former congressman, ex-Rep. Joseph E. Casey, of Massachusetts, may be facing a contempt action because of his refusal to discuss the matter before the subcommittee, which he said was set up



Faithful Automatic Pumping Station

This pumping station of Deep Rock Oil Corp. near Drumright, Okla., has completed its twenty-second year of service. The installation utilizes the first automatic pumping units in Oklahoma, and works by maintaining a proper level of oil in the tank in the background. During the 22 years of operation, a little more than $500 has been spent in repairs, and the station now keeps an average of 3,000 bbl. of crude moving daily from Drumright field to the company's Cushing, Okla., refinery.

to probe the activities of the Reconstruction Finance Corp. and has no right to dig into his dealings with the Maritime Commission. However, he said, he would be willing to cooperate fully with any duly authorized congressional committee empowered to investigate Maritime Commission activities.

Called as witness.—The tanker deal bobbed up in hearings earlier last month at which Casey was called as a witness during the probe of "favoritism and influence" exerted to obtain RFC loans.

In the course of his testimony, Casey disclosed the tanker deal, which, it is indicated, made a profit of $2,500,000 on a capital of $100,000. With a number of other persons, Casey said, he joined in a firm called American Overseas Tanker Corp. which arranged to charter five tankers to Standard Oil Co. (N. J.), borrowed $10,000,000 from an insurance company on the strength of the charter, and then bought five surplus tankers.

Subsidiary formed.—The group, Casey testified, incorporated a Panamanian subsidiary, Greenwitch Marine Corp. to which title to the vessels was transferred and which collected the charter fees free of United States income tax and from them paid off most of the insurance loan. The ships were finally sold at a profit of $2,800,000, he said.

Casey explained his reluctance to testify further, even though he had previously voluntarily agreed to furnish data to the subcommittee, was due to the desire of the stockholders of the company not to have their names or any of the affairs of the corporation divulged to the subcommittee.

Nothing illegal.—However, Casey insisted, there was nothing illegal or unethical in the transaction, and the tankers were sold at prices set by Congress, that a year after their purchase they could have been bought on the open market for about 60 per cent of the prices paid the Government, and that due to inflation and world events the value of all tankers substantially increased last summer.

While Fulbright's subcommittee was vainly attempting to get further information, the Senate commerce committee also began to look into the matter and in a letter to Commerce Secretary Charles Sawyer, Chairman Edwin C. Johnson, of Colorado, asked for a report on the department's role in the transaction.

"History" wanted.—Johnson told Sawyer he had been informed that Standard sought vainly to charter tankers from the commission before they were sold to Casey and his associates, and asked for the names of those involved in the deal, the "history" of any unsuccessful attempt by Standard to lease the tankers, whether the Maritime Commission knew if Casey had arranged to lease them to Standard, a list of any other commission transactions involving Casey, and whether E. Merl Young and Joseph Rosenbaum, whose names figured in the probe of RFC influence, had anything to do with ship sales.

"Flying Circus" Tour

WASHINGTON.—A five-man delegation from the Petroleum Administration will make a 5-day "flying circus" tour of the country next week to tell the story of the oil-defense effort to the industry.

Calling themselves the "dog and pony show," Assistant Deputy Administrator Al Frame, Thomas L. Upjohn, assistant director of refining, and William P. Hays, assistant director of supply and transportation division; Reid Brazell, refining director; Frank Watts, director of materials, will stage a series of afternoon meetings in five cities, one in each PAD district.

The schedule calls for sessions April 9 in the Shamrock Hotel, Houston; April 10, Biltmore Hotel, Los Angeles; April 11, Brown Palace, Denver; April 12, Hotel Stevens, Chicago; and April 13, Hotel Commodore, New York.

In each of the cities visited, representative groups of purchasing agents, producers, refiners, and others will be invited to attend the meetings, at which Frame will outline the purpose and intent of PAD, what it is for, how it is organized and what it proposes to do, while Watts will discuss the M-46 tubular-goods order and the general materials situation. Brazell will deal with the refining question with particular reference to the tetraethyl lead problem.

Col. William J. Worcester, deputy chief of the Munitions Board Petroleum Division, and Bryant Putney, PAD public relations representative, will accompany the group.

PAD Authority Expanded

WASHINGTON.—Authority of Deputy Petroleum Administrator Bruce K. Brown has been expanded by Interior Secretary Oscar L. Chapman to include all functions and powers delegated to the secretary by any government official having functions under the Defense Production Act and to redelegate such power or authority to any "appropriate" government official.

The extension of authority, provided for in Amendment No. 3 to Order No. 2591 setting up PAD, was necessary to meet the situation created by the changes in the defense structure occurring since the oil agency was created.

The original order provided only for passing on to Brown of such delegations of authority as were received from the Defense Production Administrator.

NPC Meets May 2

WASHINGTON.—The next meeting of the National Petroleum Council has been called for May 2 by Chairman Walter S. Hallanan.

In sending out the call, Hallanan said he has asked that committee chairmen be prepared to make reports on the investigations now under way on the cost in materials and money of a 1,000,000-bbl. expansion in daily production of products in the Western Hemisphere, the availability of oil and gas, costs of synthetic-liq-

WATCHING WASHINGTON

Bertram F. Linz

Lack of Enthusiasm

Defense officials in Washington are deeply concerned over the lack of enthusiasm with which industry is accepting mobilization controls.

At the Petroleum Administration, officials say the response to the defense program has been far short of what was hoped for. This has been particularly evident in the operation so far of the limitation order on tetraethyl lead and is one of the reasons why a group of top officials will leave important tasks in Washington to tour the country to tell the industry what the defense program and PAD stand for and that it has to play ball or invite stiffer regulation.

Much the same story comes from the National Production Authority and the Office of Price Stabilization—industry is resisting controls and gives grudging obedience to direct orders.

Officials believe the situation is due in part to the aura of extreme urgency which surrounded the defense program when it was first brought out but dissipated as time went on and war appeared no closer, and in part to the fact that predicted scarcities in consumers' and capital goods have not developed, probably because warehouses are filled to bulging walls with items that were expected to be unobtainable months ago.

The situation is the exact reverse of that which prevailed during the war. Then the great majority of industrialists participated wholeheartedly in the Government's control program and only a few sought to evade restrictions; now a few are participating generously but a majority appear not yet convinced that there is any need now for a wartime economy.

Rubber Cartel Talked

How much rubber will be available to the United States this year continues to be a matter of controversy.

State Department activities indicate the possibility that a long-term cartel may be developed. Industry spokesmen differ as to the future, but some declare more rubber, natural and synthetic, will be available than can be used.

A cartel reportedly was discussed during the rubber talks in London recently and another meeting will be held in the next few weeks in Rome. Also reportedly, the price under discussion is around 50 cents a pound; the present price is around 70 cents and during the war it was about 22½ cents. Domestic-rubber manufacturers assert the natural product can be delivered in New York for as little as 10 cents a pound and at an average of around 16 cents. For every cent trimmed off the current price, rubber users here would save around $24,000,000 a year.

One leading manufacturer estimated that world availability of rubber this year will be 2,800,000 tons, while requirements, including military, will run 2,175,000 tons, leaving a surplus of 625,000 tons. Present allocations indicate a civilian consumption of 1,070,000 tons in this country, plus another 200,000 for military needs; last year's total use was 1,240,000 tons.

No CMP?

A cryptic statement by Defense Mobilization Director Charles E. Wilson that there may be no controlled-materials plan July 1 is giving some of the defense agencies, PAD among them, the jitters.

Several interpretations have been placed on Wilson's statement. One is that he was referring to technical difficulties which may delay perfection of a CMP. Another is that he believes the materials situation can be handled by such procedures as allocation orders; a third that he meant there would be no single over-all order but a series of little CMP's for materials in shortest supply.

Petroleum Administration officials have been engaged for some weeks in working up programs for equipment and other needs of the oil industry for inclusion in the CMP which National Production Authority indicated would be out by July 1 and are wondering where they will be if no CMP is forthcoming. Present procedures for meeting emergency needs of the industry are not too satisfactory and will break down entirely if some method for orderly handling of the whole materials problem is not developed.

Even now, there is great difficulty in getting some needed items—pipe because the mills complain that the freight car and other programs are taking the steel they need, equipment because manufacturers cannot get small but vital components. As more and more production is earmarked for specific programs the situation will be increasingly aggravated.

uid-fuel products, manpower, critical materials, liquefied petroleum gas, and petroleum-industry steel requirements.

It is also expected the council will be asked to undertake new studies by Administrator Oscar L. Chapman of problems that have developed since its last meeting January 29.

NPA Issues Control Orders

WASHINGTON.—The following orders have been issued by the National Production Authority:

Amendment to Order M-5, March 26: Increasing the reservations by producers and fabricators of aluminum to meet defense-rated orders by 15 per cent.

Amendment to Order M-33, March 27: Providing for monthly allocations of molybdenum after May 1.

Direction 2 to Order M-12, March 27: Providing adjustments of permitted consumption of copper and copper-base alloys for companies shut down during the 1950 base period.

Amendment to Order M-18, March 30: Tightening controls on the end-use of hog bristles and the manufacture and sale of paint brushes.

Transport-Storage Committee

WASHINGTON.—Adding to the growing list of interagency groups working on mobilization problems, Defense Mobilization Director Charles E. Wilson set up a committee on transportation and storage to improve the coordination and effectiveness of federal policies in those fields.

The committee will be composed of representatives of the Department of State, Defense, Interior, and Commerce, the Defense Production Administration, and the Defense Transport Administration, and will concern itself primarily with interagency problems, policies, and programs, and with matters relating to two or more forms of transportation under the jurisdiction of different agencies.

Under a recent presidential order, responsibility for transportation and storage facilities was divided among several agencies, the secretary of the interior being given authority over pipe-line facilities, while the Interstate Commerce Commission was given rail transportation and storage, including petroleum storage, and the secretary of commerce was given ocean shipping.

The specified duties of the defense-transportation committee will be to advise the director of defense mobilization on problems relating to defense transportation and storage and review policies, plans and programs relating to them, advising the director concerning methods for improving the coordination and obtaining the most effective utilization of the various forms and facilities of transportation and storage.

Small Refiner Lauded

He occupies an important place in future mobilization program, PAD refining-division director tells W.P.R.A.

George Weber

SAN ANTONIO.—The small refiner occupies an important place in the future mobilization program. Representing a segment of the industry capable of great flexibility, the independent refiner is expected by mobilization planners to strengthen his position by expansion of capacity and extension of operations, Reid Brazell, director of the Petroleum Administration for Defense's refining division, told members of the Western Petroleum Refiners Association here this week.

Speaking at the thirty-ninth annual meeting of the group, Brazell said it is becoming more and more apparent that the over-all demand for petroleum products will increase rapidly, in view of the fact that there is no plan for curtailment in civilian use. In recent weeks, for example, motor-gasoline production has been approximately 18 per cent above the corresponding period last year. While still only a small portion of the total, military requirements during the last half of this year are expected to increase 20 per cent over the first half. During the same period, aviation gasoline is expected to increase some 30 to 35 per cent and jet fuels 20 to 30 per cent.

Avgas.—The primary shortage, Brazell said, is aviation gasoline. In contributing to this program, small refiners have installed and are presently operating catalytic cracking units while many others have plans to install such units. There was a time, he said, when catalytic cracking units were too expensive for the small refiner. PAD views to the small refiner was an important factor in the possible future cost reduction of alkylation units as well.

Retiring President R. W. McDowell, of Mid-Continent Petroleum Corp., Tulsa, expressed the conviction that the industry, if allowed to operate free of the "improper" restrictions and excessive-tax impositions, will adequately meet the needs of both civilian and military requirements.

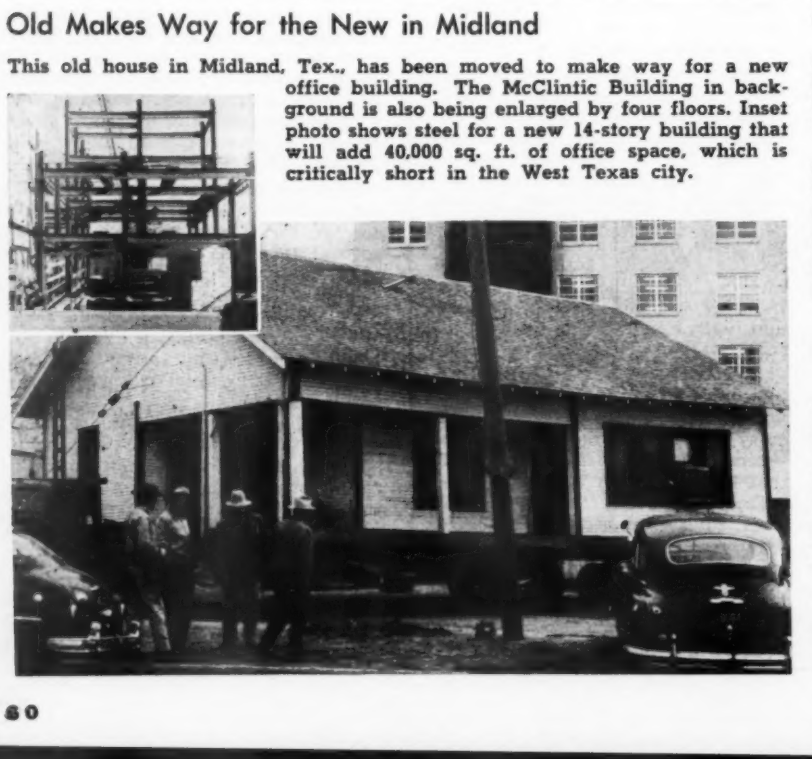
T.C.P. discussed.—The opening session of the meeting concerned fuels. Blake Reynolds, of Texaco Development Corp., discussed the new Texaco Combustion Process which will shortly advance to the multicylinder-testing stage. C. C. Tate, of Phillips Petroleum Co., reported on a new development in radiant heating which shows tremendous possibilities for improving not only thermal cracking and visbreaking but also thermal destruction of light hydrocarbons or other applications where short residence times are essential.

Officers.—R. L. Tollett, of Cosden Petroleum Corp., Big Spring, Tex., was elected president of the association, succeeding McDowell. Newly elected vice presidents are H. J. Kennedy, of Continental Oil Co., Houston, and J. W. Vaiden, Skelly Oil Co., Tulsa. F. L. Martin, of Sunray Oil Corp., Tulsa, and Roland Vrodman, of Anderson-Prichard Oil Corp., Oklahoma City, were reelected as vice presidents. New directors included Lee Haugen, Cities Service Oil Co., Bartlesville, Okla.; L. D. Mann, Cities Service Refining Corp., Lake Charles, La.; M. H. Robneau, Frontier Refining Co., Denver, and J. S. Wertz, Vickers Petroleum Co., Inc., Wichita.

The first honorary office ever created by the association was awarded to H. W. Camp, of Cities Service Oil Co., who was retired this year from the board of directors at his own request. He will remain active in the association as adviser to the board.

Old Makes Way for the New in Midland

This old house in Midland, Tex., has been moved to make way for a new office building. The McClintic Building in background is also being enlarged by four floors. Inset photo shows steel for a new 14-story building that will add 40,000 sq. ft. of office space, which is critically short in the West Texas city.



Oil Activity Declines

BATON ROUGE, La. — Louisiana petroleum activity showed some decreases in February, the state Conservation Department has reported.

Drilling permits dropped to 125 from 167 in January, and well completions totaled 122, compared with 175 the previous month. The completions included 56 oil wells and 14 gas wells. Of the 125 permits issued, 21 were for exploratory wells and the remainder for holes in or near already proven areas.

As the month ended, the department reported, 224 drilling rigs were active over the state, 136 in South Louisiana, 88 in the southern half of the state.

Final figures on January operations showed oil production averaged 638,931 bbl. per day, gas production averaged 3,766,211,000 cu. ft. per day, and runs to refinery stills averaged 496,974 bbl. per day. Stocks on hand at the end of January were 3,712,506 bbl.

Exploration Library Planned

SHREVEPORT. — The Ark-La-Tex Geophysical Society, Shreveport Geological Society, and East Texas Chapter, American Institute of Mining and Metallurgical Engineers, have completed preliminary plans for a petroleum exploration library to be housed in Shreve Memorial Library here.

The library will be operated in conjunction with the institution, and a drive is now being made to obtain books and publications pertaining to the oil and gas industry.

T.I.P.R.O. Action

Group refuses to favor fixing of state-wide minimum gas price but adopts resolutions to end "discriminations"

Leigh S. McCaslin, Jr.

BEAUMONT.—The Texas Independent Producers and Royalty Owners Association refused to go on record here last week favoring the fixing of a state-wide minimum price at the well head for natural gas. The group did, however, adopt several resolutions designed to help eliminate what it termed "inequities and discrimination" in the price pipe-line companies pay for natural gas in Texas.

The subject of gas dominated the 2-day meeting as resolutions were passed as follows:

1. Favoring legislation making it clear that the Railroad Commission has the authority to set a minimum price for gas in a particular field after notice and hearing where the commission finds that such action will prevent waste or conditions conducive to waste.

2. Urging the Railroad Commission to request the filing of all gas-producers contracts with the commission, as public records, so that a study may be made of them to determine that such contracts do not tend to cause waste in any gas fields.

3. Asking the commission to initiate hearings on all gas fields in Texas to determine whether or not the present method of prorating, producing, marketing, and transporting of gas from any field is conducive to waste.

4. Opposing any extension of the authority of the Federal Power Commission into "the purely local matter" of the production and gathering of gas.

Heated discussion. — Two hours of heated discussion preceded passage of the resolution favoring authority for the Railroad Commission to set minimum prices in certain fields. Several well-known independents made strong talks opposing any kind of governmental control over gas prices. Another expressed the fear that action setting minimum gas prices will result in the abrogation of gas contracts. He deplored what he described as the tendency in government to ignore and overrule existing contracts.

Higher prices. — Other T. I. P. R. O. members pointed to the fact that the law of supply and demand is resulting in higher and higher gas prices. They said, that in many cases, good prices are now being received for gas being sold to pipe-line companies. (A price of 12 cents per thousand cubic feet was publicly announced a few weeks ago.) The expansion of gas markets in the North and East will result in better prices through the years, some pointed out. Sellers can almost name their own terms right now, one member told the group.

Favoring the resolution a T.I.P.R.O. member said that it is important that the state be given some kind of authority over natural-gas prices. If this is not done, he said, the Federal Power Commission will step in and assume price control over Texas natural gas. One FPC member has already said that the federal agency plans to control gas prices where the state is not doing so, he asserted.

Peril-point amendment. — In a resolution not pertaining to gas T.I.P.R.O. expressed support for the proposed peril-point and escape-clause amendments for the Reciprocal Trade Agreements Act. The group also reaffirmed its position favoring ownership of the tidelands by the states and its support of the present depletion allowance and intangibles charge-off provision of the Internal Revenue Code.

Tax burden deplored.—In the president's address, R. L. Foree, of Dallas, deplored the tax burden being placed on the industry by both state and federal governments. He said that in Texas "no one familiar with the facts can deny that our industry is grossly overtaxed while some escape almost tax free." This is also true in Washington, he said.

New executive committee members elected by T.I.P.R.O. during the meeting were S. D. Johnson, Wichita Falls; C. J. Follston, Amarillo; P. S. Kenrick, Abilene; E. I. Thompson, Austin; Guy I. Warren, Corpus Christi; Bryan W. Payne, Tyler; R. L. Foree, Dallas; Jack Woodward, Dallas; Early Cilburn, Victoria; Charles E. Thompson, McAllen; Don W. Wilson, Stratford; and George W. Pirtle, Tyler.

The Austin headquarters staff consisting of the following were re-elected: E. I. Thompson, executive vice president; Alvis Vandygriff, general counsel; and Earl Turner, publicity.

Fort Worth was chosen as the 1952 convention city.

"No Pipe"

Materials situation will get worse because too little tubular goods is being made, T.I.P.R.O. speakers declare

BEAUMONT.—The two words "no pipe" summarize the addresses given here before the Texas Independent Producers and Royalty Owners Association by the head of the Petroleum Administration for Defense and one of his chief lieutenants.

This blunt appraisal was made by one of the 300 independents attending the 2-day meeting. The speakers were a little less blunt, but not much. Bruce K. Brown, deputy administrator of PAD, told the Texans that "the materials situation is bound to get worse before it gets better." Richard G. Lawton, production director of PAD, said that "there will not be enough oil-country tubular goods produced in 1951 to meet the industry's prospective drilling programs."

Repercussions.—The anticipated pipe shortage will have these repercussions the two speakers said.

1. The Government's minimum annual goal of 43,400 wells drilled will not be met.

2. It may be necessary to restrict or eliminate deliveries of natural gas to industrial consumers in some localities next winter.

3. Procedures will be set up for scheduling line-pipe deliveries for oil and gas operations based on the relative essentiality of each project. (This has already been done for casing and tubing.)

Statistics cited.—Brown and Lawton presented a number of statistics to prove their contention that pipe is going to be hard to get. Line-pipe orders accepted by the mills for delivery during 1951 have been moved back from 3 to 12 months. During the first quarter of this year only about 130,000 tons a month of tubular goods have been produced as compared with a rate of about 150,000 tons a month during 1950. (Lawton estimated that monthly production must average 157,500 tons if 43,400 new domestic wells are to be drilled in 1951.) Output of line pipe by the end of the fourth quarter of 1950 was nearly 40 per cent below the average for the second and third quarters.

Remedy sought.—Lawton assured his listeners that the PAD was trying to remedy the situation. He warned, however, that "PAD is not the defense agency of Government which has authority to direct steel allocations and cannot control the tonnage made available for this purpose. . . Order M-46 only sets up the mechanism for channeling materials to petroleum producers. It does not guarantee that enough steel can be made available to meet all drilling needs."

T.I.P.R.O. OFFICERS.—Officers of Texas Independent Producers and Royalty Owners Association who were selected at the group's Beaumont, Tex., meeting last week include, left to right: William T. Beard, Jr., San Antonio, treasurer; Guy I. Warren, Corpus Christi, chairman of the executive committee; R. L. Foree, Dallas, president; and Vernon W. Frost, Houston, secretary.

To help alleviate the shortage, the production director asked that operators supplement mill orders through the use of tubular material already in stock, use second-hand materials wherever possible, and use all possible conservation measures.

If steel were available, the PAD estimates that the operators of this country would drill the tremendous total of 52,000 wells a year—20 per cent more than the Government is asking. This figure is based on the applications PAD has thus far received for priorities on third-quarter drilling programs. Lawton said that enough drilling rigs as well as enough proven locations and indicated structures are available to reach the annual figure of 52,000 wells.

Little slack.—Brown emphasized that the fact there is "very little slack" of excess producing capacity makes the materials problem "very much more serious than it otherwise would be." He restated the mobilization objective of stepping up crude-producing capacity by at least a million barrels a day. This is a minimum figure, he emphasized.

Earlier in the day, Lt. Gen. Ernest O. Thompson, member of the Texas Railroad Commission, told T.I.P.R.O. that the million barrels daily of excess producing capacity is going to be difficult to reach. He said that the PAD pipe allotment for wildcat wells should be doubled. (Beginning in April, 5 per cent of the casing and tubing produced will be set aside as an emergency pool with wildcat wells having first call on the pipe.)

Advance notice.—Lawton gave the T.I.P.R.O. members advance notice of future action to be taken by PAD. He said that operators will be required to furnish a receipt for the priorities material used in every well. This receipt will take the form of a well-completion report which will call for "information on well spacing and tonnage of tubular goods used, as well as a casing record, showing specifications of the material, and the date of cementing." It may also call for the name of the company running the electric log and other information not yet decided upon.

Operators were also told by Lawton that they will be notified by April 16 of the action taken on their applications for third-quarter priorities assistance.

Gas-Tax Decisions Delayed

AUSTIN.—A decision on three natural-gas tax bills was indefinitely delayed by the Texas House revenue and taxation committee while an additional tax-bill was transferred to the agriculture committee by house action.

The agriculture committee is considered more favorable to the bill which would levy an assessment of 1 cent per 1,000 cu. ft. of all gas going into pipe lines and allocate one-fourth of the prospective income to incorporated cities for street improvements.

Rep. Jim Sewell, East Texas, sponsor of the bill, claimed the revenue and taxation committee chairman, Rep. Jim Lindsey, Texarkana, told him the committee was so busy it could not assure a hearing on the bill unless it was considered simultaneously with other gas-tax measures. Lindsey denied this and asserted the bill would be accorded an early hearing. Nevertheless, the house voted 60-65 to transfer the bill.

The action to delay hearing on the three other natural-gas-tax bills came after a public hearing on gas levies proposed by Reps. R. E. (Peppy) Blount, Big Spring, and Deno Tufares, Wichita Falls.

Spokesmen for oil, gas, chemical, aluminum, and power industries said Blount's tax proposal or Tufares' measure for a rate of ¼ cent per 1,000 cu. ft. of production, or 1½ cents per 1,000 cu. ft. on the gathering of gas would be ruinous. After hearing opposition to his plan to double the gas take, Blount conceded that the rate might be a little too stringent.

"Industries always say taxes are going to put them out of business. You won't close the market with this tax increase," Tufares said.

Gas-Flaring Hearing Set

AUSTIN.—Operators in Fulton Beach field of Aransas County, Texas, have been ordered by the Texas Railroad Commission to show cause why large quantities of gas now being flared should not be utilized.

The commission's engineering department has determined that approximately 4,500,000 cu. ft. per day of natural gas is being flared and vented in the field.

The operators were ordered to show cause at a hearing to be held here May 9 why the field should not be closed in order to conserve this natural resource if such gas cannot be diverted to a legal use.

Excess Crude Capacity Low

DALLAS.—William J. Murray, Jr., Texas Railroad Commissioner, told the Petroleum Engineers Club meeting that domestic consumption of petroleum products, especially heating oils, had wiped out Texas' excess crude-oil-producing capacity.

Murray said that Texas' excess producing capacity of 600,000 bbl. daily was strictly on "paper" and was based on maximum-efficiency-flow rates that were too optimistic. He said that actually Texas had an excess of about half that figure.

He pointed out that prior to World War II the nation had an excess producing capacity of over 1,000,000 bbl. daily, and because of that margin the petroleum industry was able to get along on less steel and fewer wells during the war. Now, with little or no excess production, he declared, the industry will need more steel to drill more wells.

X-ray Machine Installed

AUSTIN.—University of Texas scientists have installed an $8,000 X-ray machine which will be used to solve boiler-scale problems, examine oil-well cores in detail, and to work out other metallurgical and chemical problems.

The 40,000-volt machine, financed mostly by private grants, will be used for university research and public service under the direction of Dr. Stanley H. Simonsen of the chemistry department. At other institutions, such X-ray units have made possible the doubling of an aircraft engine's horsepower with no increase in size and weight.

Phillips Hearings Open

Authority of FPC to regulate independent producers and gatherers of natural gas moves toward first real test

Henry D. Ralph

BARTLESVILLE, Okla.—The authority of the Federal Power Commission to regulate independent producers and gatherers of natural gas moved toward its first real test this week as hearings opened into the gas operations of Phillips Petroleum Co.

The case is an investigation ordered by the FPC on October 28, 1948, to determine whether Phillips is "a natural-gas company" as that term is defined by the federal Natural Gas Act. If the commission so finds, and if the finding is upheld in the courts, the FPC may regulate the rates at which Phillips sells gas to interstate pipe lines.

And, it is generally believed, if Phillips is subject to such regulation, so are many other if not all independent producers who sell gas to interstate pipe lines.

High interest.—It is this aspect of the case that has aroused the interest of the entire oil and gas industry and has brought to Bartlesville attorneys and observers for a large number of oil companies, trade associations, and state-regulatory bodies.

For several years there has been a running debate over the commission's authority to regulate field prices of gas. Apparently Congress did not intend to confer such authority in the original Natural Gas Act. But some court decisions suggest that such authority might be read into the act by interpretation, and FPC officials on several occasions have expressed the opinion that this authority exists and that the commission would soon attempt to exercise it.

Amendments fail.—Congress has made several attempts to amend the act with a specific prohibition against regulation of independent gas producers. The latest attempt, the Kerr bill, was vetoed by President Truman April 15, 1950. This strengthened the view that FPC can regulate producers, and the commission scheduled the Phillips case for hearings last May *(see The Oil and Gas Journal, April 20, 1950, page 133)*.

Case history.—The Phillips case arose because the company is the sole supplier of natural gas for Michigan-Wisconsin Pipe Line Co., an interstate carrier subject to FPC regulation. The gas is produced by Phillips and other independents in the Hugoton-Panhandle area of western Kansas, Oklahoma, and Texas, and is gathered by Phillips and delivered to the terminus of the Michigan-Wisconsin trunkline. The city of Detroit, and the states of Michigan and Wisconsin, acting on behalf of consumers of this gas, complained to FPC that Phillips price is too high, so the commission ordered the investigation.

First the FPC must determine whether or not it has any jurisdiction over Phillips. If it obtains jurisdiction, the next question is whether it can and will order a reduction in the price at which the gas is sold in the field.

Both questions are of vital concern to the entire natural-gas industry in all states.

Many independents sell.—There are thousands of independent producers of oil and gas who sell some gas which eventually is transmitted through interstate pipe lines. They have assumed that they were free from FPC regulation when gas is sold under "arm's-length" contracts, meaning that the two parties have no corporate connection and the deal is made on the basis of free bargaining between independent concerns.

So far as the facts have been developed, there is no essential difference between the way Phillips serves Michigan-Wisconsin and the operations of virtually all other producers selling gas to interstate lines. Therefore, all producers feel that they are in the same boat with Phillips, and that if Phillips is subject to FPC control so are they all.

Would order reductions.—If the commission obtains jurisdiction over independent producers, the assumption is that it would order reductions in the field price of gas in the interest of consumers at the far ends of interstate pipe lines. It could do this by application of the so-called public-utility theory of rate regulation which limits an operator's return to a fixed percentage of capital invested. Producers contend that this theory is not appropriate for fixing the price of natural gas in the field because of the highly individual and varying cost factors surrounding the discovery and production of gas from different wells.

New factor.—A new factor has entered the picture since the Michigan-Wisconsin line was started. The states of Kansas and Oklahoma have enacted laws fixing minimum field prices for gas. The Oklahoma law has been upheld by the Supreme Court of the United States as a valid exercise of conservation powers, and the Kansas law has been upheld by the highest court in that state. In both instances the minimum price is higher than the original contract between Phillips and Michigan-Wisconsin.

This raises the question whether the FPC can, or would attempt to, order a producer to sell gas at less than the minimum fixed by a state.

Intervenors.—Because of the many important questions involved in this Phillips case, a number of interested parties have formally intervened as parties to the proceeding. These include the regulatory bodies of seven oil and gas-producing states—Oklahoma, Kansas, Texas, Louisiana, Mississippi, Arkansas, and New Mexico—all in opposition to the FPC position. Other intervenors on the same side are the Independent Natural Gas Association of America, the Texas Independent Producers and Royalty Owners Association, and several regional groups of gas producers.

Long hearings expected.—Since all these intervenors can introduce testimony and examine witnesses, the hearings are expected to last for several weeks. The hearings are being conducted by Edward Marsh, trial examiner for the FPC, and the commission's case is being presented by Howard Purdue, of its legal staff. Following the hearings Marsh will make a proposed report to the commission, and oral arguments probably will be held before the full commission in Washington before there is a final decision.

Adams issues statement.—None of the parties to the case has indicated the line of testimony or argument it will present, but on the eve of the opening hearing, K. S. Adams, president of Phillips, issued a statement saying:

"It is unfortunate that the Federal Power Commission seeks to regulate the sale of gas by independent producers and gatherers at a time when a large number of consumers in the nonproducing states are just beginning to enjoy the advantages of natural gas as a fuel."

Should the case result in lowering the field price of gas, Adams said, it would be a grave injustice to consuming centers because this would discourage further exploration for and development of natural gas reserves and ultimately dry up the flow of natural gas to eastern and northern consuming centers.

"I am hopeful that the FPC will ultimately get back on the track it has consistently followed since the Natural Gas Act was passed in 1938 and hold that it has no jurisdiction to regulate independent producers and gatherers of gas," Adams concluded.

Geophysical Activity

Number of exploratory geophysical crews in Alberta now totals 107, an all-time high; western Canada's total: 119

CALGARY.—The number of exploratory geophysical crews operating in Alberta has climbed to 107, a new all-time high, making geophysical activity in the province greater than for any state in the United States except Texas. With 10 geophysical crews in Saskatchewan and 2 in Manitoba, western Canada's total now stands at 119.

Out of the total of 119 geophysical parties, 108 are operating with seismographs, 9 with gravimeters, and 2 with magnetometer, 1 of which is airborne. Alberta has 97 of the seismic parties, Saskatchewan 9, and Manitoba 2. The gravimeter parties are all in Alberta except one, which is in Saskatchewan. Both magnetometer parties are in Alberta.

Imperial most active.—The most active company in geophysical work is Imperial Oil, Ltd., which has 15 parties in the field including 12 seismographs and 1 gravimeter in Alberta and 2 seismographs in Manitoba. Canadian Gulf Oil Co. has 12 parties, including 10 seismic and 1 gravity in Alberta and 1 gravity party in Saskatchewan.

In Alberta Texaco Exploration Co. has nine geophysical crews working, eight seismic, and one gravity. Socony-Vacuum Exploration Co. also has nine active crews, six of which are seismic, two are gravity, and the other a ground magnetic. Shell Oil Co. and California-Standard Oil Co. each have eight seismographs operating. British American Oil Co. is operating seven seismographs, with Cities Service Petroleum Co. two seismographs, Sinclair Canada Oil Co. one seismograph alone, and one with Federated Petroleums, Ltd. Cities Service and Sinclair each have one seismograph on their own in Alberta.

Other firms.—Also in Alberta, Sun Oil Co. is operating five seismographs. Seaboard-Honolulu-Sunray group and Amerada Petroleum Corp. are each running four seismic parties. Canadian Superior Oil of California has three seismographs and one gravimeter. Phillips Petroleum Co. is operating four seismic parties in Alberta and with Husky Oil & Refining, Ltd., is working one seismic party in Saskatchewan.

Stanolind Oil & Gas Co., Union Oil Co. of California, and Hudson's Bay Oil & Gas Co., each have three geophysical parties in Alberta, all seismic except a gravity party of Union. The Hudson's Bay-Union team has two seismographs engaged in Alberta. Pacific Petroleums, Ltd., is operating one seismograph and an airborne magnetometer. A. G. Bailey Co. & Associated has one gravimeter at work. Weiss Geophysical Corp. of Canada is working one seismograph.

Sohio Petroleum Co. is still operating four seismograph crews in Saskatchewan. Also in Saskatchewan are the Tide Water Associated Group and Albercan Oil Corp., each with two seismograph parties.

Oil Production Increases

OTTAWA.—Official figures issued by the Dominion Bureau of Statistics place Canada's 1950 oil production at 29,058,067 bbl., compared with 21,464,322 bbl. in 1949.

Alberta production increased from 20,246,392 to 27,580,680 bbl.; Saskatchewan production from 782,188 to 1,022,408 bbl.; and the North-West Territories (Fort Norman) field from 155,528 to 189,472 bbl. Ontario was down from 260,670 to 248,623 bbl. and New Brunswick from 19,544 to 16,884 bbl.

The major Alberta gains were in Redwater field, up from 4,793,491 to 10,746,472 bbl. and, Leduc field, from 9,688,783 to 10,589,472 bbl. Production from other Alberta areas in 1950, in barrels, was: Lloydminster, 809,701; Turner Valley, crude, 3,344,007, natural gasoline, 431,362; Conrad, 110,062; Dina, 17,887; Excelsior, 272,186; Golden Spike, 292,873; Joseph Lake, 168,855; Normandville, 28,200; Princess, 122,109; Stettler, 246,198; Taber, 114,916; Vermilion, 49,041; Wainwright, 15,360; Whitemud, 45,437; and other areas, 175,642.

Natural-gas production from all Canadian fields in 1950, as shown by official figures, totaled 70,410,230 M.c.f., compared with 60,457,177 M.c.f. in 1949.

By provinces, the 1950 production in M.c.f. was: New Brunswick, 342,405; Ontario, 11,150,804; Saskatchewan, 501,198; and Alberta, 58,415,823.

Refinery Work to Start

Erection of the main units for the new 20,000-bbl. daily refinery to be built by Canadian Oil Companies, Ltd., near Sarnia, Ont., will start immediately, according to W. Harold Rea, company president.

Full approval of the refinery as an essential war plant has been given by the federal Government of Canada, and every effort is being made to have the refinery completed and operating a year hence.

Rea told the shareholders meeting in Toronto last week that contracts have been signed to supply Polymer Corp. with butylenes for synthetic rubber and Dow Chemical Co. with certain gases. These are byproducts from operation of the new refinery.

A $2,000,000 oil blending and grease-manufacturing plant under construction for a year at Montreal East will be completed by midsummer, the company president said.

Because of defense needs, "it now seems certain that the entire output of these plants will be required immediately they are in operation," Rea reported. The new refinery will produce both high-quality aviation-gasoline-base stock and fuels required in jet engines, in addition to its majority output of automotive gasoline. The refinery will represent 20 per cent of the additional 100,000 bbl. daily of refining capacity needed in Canada to meet petroleum-product needs for both military and civilian use.

Improvement Contract Let

Canadian Kellogg Co., Ltd., Toronto, has received the contract for construction of an atmospheric and vacuum-distillation unit, fluid catalytic cracking unit, and light-ends recovery plant at the Sarnia, Ont., refinery of Imperial Oil, Ltd.

The new facilities are being built as a part of a recently announced program to increase capacity of the refinery from 55,500 bbl. daily to 71,000 bbl. daily. The distillation unit, with a capacity of 46,500 bbl. daily, and the catalytic cracking unit with 23,250 bbl. daily capacity will be the largest of their kind in Canada.

Imperial said the starting date will be governed by delivery of materials but it is hoped that work on the foundations will begin this fall. Some preparatory work on the site for the new units will be under way shortly, and at peak of construction, the project will employ between 700 and 800 men. Completion will require an estimated 20 to 24 months.

Technicians in Alberta

A group of technical officials of Anglo-Iranian Oil Co., Ltd., London, are in Alberta for a study of the possibility of producing oil commercially from the Athabaska tar sands in northern Alberta.

The party of three from Anglo-Iranian's London headquarters consists of Dr. D. A. Howes, of the company's research and development division; J. F. Watson, geologist; and P. A. Medcraft, of the company's commercial service.

WEST COAST

Unconventional Rig

Novel equipment features diesel-electric engines

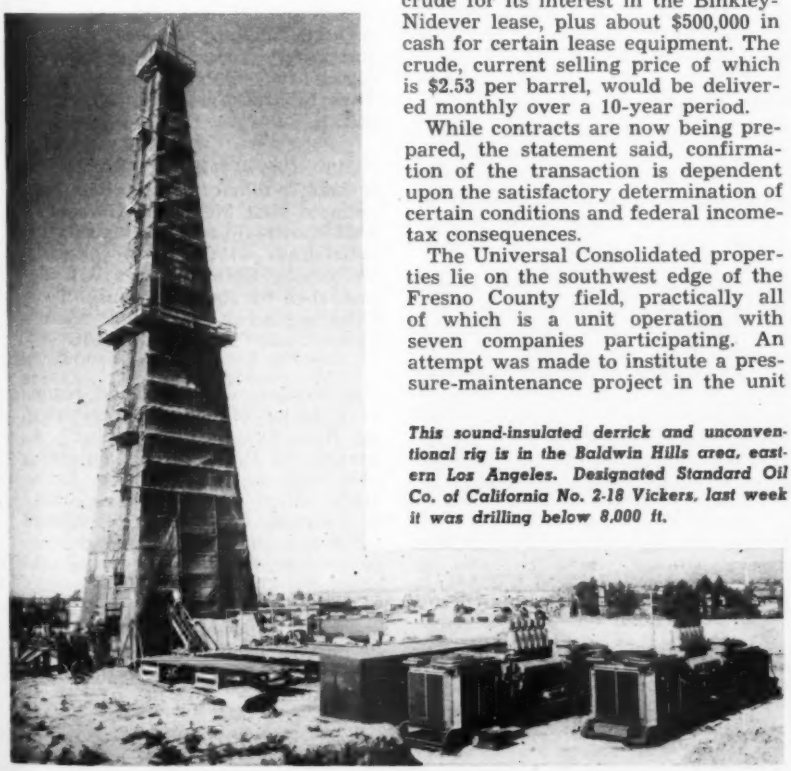
D. H. Stormont

LOS ANGELES.—Two locomotive-type diesel engines salvaged from a Navy L.S.T., three electric submarine motors, a draw works from an idle steam rig, plus a lot of original design ideas are incorporated in an unconventional 2,400-hp. diesel-electric rig at work in the Baldwin Hills area of eastern Los Angeles.

Designed for economically drilling deep tests to 15,000 or 20,000 ft., as well as routine 8,000 to 12,000-ft. holes, the rig contains several novel design and arrangement features. The draw works, silent-chain driven by a 1,500-hp. d.c. motor, is set at ground level beneath the floor of the 150-ft. derrick and 12-ft. substructure. Its position has been rotated 180° so that the drum opening faces away from the hole.

No heavy substructure.—As both the rotary unit and platform for racking drill pipe are supported independently of the derrick floor, there is no need for heavy substructures such as are used at conventional rigs. Use of d.c. motors and pneumatic and electric controls permits finger-tip operation of the complete rig by the driller from his console on one side of the derrick floor. Forced-air ventilation is used at all motors and other electrical units where explosive gases might accumulate.

Amplidyne controls.—Another feature is the extensive use of amplidyne controls to regulate the output of large motors and to obtain equal distribution of load between the two main generators when they are paralleled. This type of control also provides a means of limiting torque on motors as they can be preset to limit the power which the generator can deliver to them. Although these machines, in many respects similar to a d.c. exciter, were developed 10 years ago, this is believed to be the first rig where generators, draw works, mud-pump, and rotary motors all use amplidyne control. (A more detailed article on this rig will appear in the April 19 issue.)



This sound-insulated derrick and unconventional rig is in the Baldwin Hills area, eastern Los Angeles. Designated Standard Oil Co. of California No. 2-18 Vickers, last week it was drilling below 8,000 ft.

Purchase Offer Clarified

LOS ANGELES.—The offer of operators comprising the Coalinga Nose unit operation to purchase Universal Consolidated Oil Co.'s properties bordering on the unit was clarified here last week.

In its annual statement to stockholders, Universal Consolidated said that the company had been offered a consideration of 10,000,000 bbl. of crude for its interest in the Binkley-Nidever lease, plus about $500,000 in cash for certain lease equipment. The crude, current selling price of which is $2.53 per barrel, would be delivered monthly over a 10-year period.

While contracts are now being prepared, the statement said, confirmation of the transaction is dependent upon the satisfactory determination of certain conditions and federal income-tax consequences.

The Universal Consolidated properties lie on the southwest edge of the Fresno County field, practically all of which is a unit operation with seven companies participating. An attempt was made to institute a pressure-maintenance project in the unit but because of down-structure movement of crude to the Universal properties, the program was suspended in January *(The Oil and Gas Journal, March 15, 1951, page 52)*.

Navy Crude to Be Sold

LOS ANGELES.—Bids for the purchase of the Navy's share of crude oil from the Stevens zone in the Elk Hills Naval Oil Reserve will be opened here April 16.

The contract offered by the Navy will be for a 3-year period beginning 10 days after approval, and it is estimated that approximately 60,000 bbl. of crude a month will be available to the purchaser.

Navy officials said actual deliveries, however, will depend upon practical considerations in field operations, the rate and continuance of production from the Stevens zone for the Navy's account under the unit plan contract with Standard Oil Co. of California, which is operating the reserve, and the quantities which the operating committee may reserve for use in connection with contract operations.

MID-CONTINENT

Repressure Project

Gas injection to start at Northeast Elmore July 1

Joseph A. Kornfeld

OKLAHOMA CITY.—Gas-injection operations are scheduled to begin July 1 in the new Third Deese Unit in the Northeast Elmore pool, Carter Oil Co., the unit operator, announced this week.

On January 1, 17 oil companies officially joined hands to participate in the unit, including Anderson-Prichard Oil Corp., British-American Oil Producing Co., Deep Rock Oil Corp., Globe Oil & Refining Co., Kerr-McGee Oil Industries, Inc., Magnolia Petroleum Co., Mid-Continent Petroleum Corp., Phillips Petroleum Co., Max Pray, Sinclair Oil & Gas Co., Standard Oil Co. of Kansas, Superior Oil Co., Sun Oil Co., Tide Water Associated Oil Co., Vickers Petroleum Co., Inc., and Zephyr Petroleum Corp.

Carter has a 52 per cent interest in the unit. Under Oklahoma's unitization law, all working interests and royalties in the Third Deese reservoir are being produced as a single unit. At the time of unitization, there were about 83 oil wells included in the unit.

Gas injection.—More than $650,000 will be spent by the member companies for construction of a 1,760-hp.

compressor plant, installation of a gas-gathering system to serve about 100 oil wells, a high-pressure gas-injection system, and for consolidation of 53 tank batteries.

Makeup gas will be obtained directly and indirectly from produced gas from wells lying within the unit. Carter estimates that the available gas rate will be about 22,500 M.c.f. daily by July 1, when gas-injection operations start. Of this amount, about 11,000 M.c.f. per day will be gathered and sent to the Antioch gasoline plant of the Garvin County system where it will be stripped of its liquid components. The residue gas returned from the Antioch plant, in the amount of about 8,000 M.c.f. per day, plus 11,000 M.c.f. of lean, raw casing-head gas, will be dehydrated and compressed to about 2,050 psi. and injected into the Third Deese sand which lies at a depth of about 6,400 ft.

A series of injection wells will be converted this spring from existing oil wells lying on the east or updip side of this reservoir.

GULF COAST

Deep Test to Start Up

HOUSTON.—The Stone County, Mississippi, deep wildcat test which has been slowed down since March 2 when it blew out at 20,300 ft. is expected to start up again in 3 or 4 days, according to Tom McKinney, drilling superintendent.

Present depth of the hole is in excess of 20,400 ft., reached during cleaning-out operations last week. The high-pressure gas is making it difficult to keep the mud properly conditioned and new mud, which is being placed in the hole, has been increased to a weight of 11 lb. per gallon.

The actual bottom-hole pressure is unknown at the present time but McKinney said they expect to run a test in the next 2 weeks.

The wildcat, George Vasen 1 Tung Oil Corp., will be the world's deepest producer if completed.

Gulf Gas Moves to Market

LAKE CHARLES, La.—Gas from the Gulf of Mexico is now moving to market for the first time, marking a historic event in the history of the natural-gas industry.

Gas production from Pure Oil Co.'s Rollover field, 10 miles offshore, is being picked up by Tennessee Gas Transmission Co. for its cross-country line, and it is being moved from Pure's producing platform through an 8⅝-in. marine line operated by Marine Gathering Co., Houston. At present about 10,000,000 cu. ft. daily is being gathered from four producing wells in the offshore field.

ALONG THE GULF

Leigh S. McCaslin, Jr.

Politics and Oil

NEW ORLEANS.—As usual, politics is hot down here in "cajun" country. The oil industry, along with the rest of the state, is watching with interest the campaign antics of 33 announced candidates for governor of Louisiana. The large number of candidates is unusual and so is the fact that they are campaigning loudly and strongly 10 months ahead of election time. Governor Long is running for lieutenant governor and present Lieutenant Governor Dodd is running for governor, as they cannot succeed themselves.

Louisiana politics are of special interest to the oil and gas industry because of the high taxes which the industry pays. Not only is the severance tax on crude high, but the retail gasoline tax paid by the consumer is one of the nation's highest.

Over in Beaumont, Tex., where the citizenry is celebrating the fiftieth anniversary of Spindletop field—"Where Oil Became an Industry"—an interesting law suit is under way. The will of John W. "Bet-A-Million" Gates, one of the better known figures of Spindletop, is the subject of the suit. Seventy-eight thousand shares of The Texas Co. stock worth $7,000,000 are involved.

Juiciest current gossip in New Orleans oil circles concerns two recent successful wildcats, one which produced about 1,500 bbl. daily and the other 600 bbl. The amount of the production is not the point of interest.

It seems that only a few months ago a certain major oil company dropped the leases on which the producers are located. Another large company stepped in and leased the land from the state and within a matter of weeks found oil in the land.

No doubt, there is a geologist somewhere with a red face. The company which hit the pay is establishing a reputation for finding oil where others give up. Several similar situations have occurred within the past few years.

"It's an ill wind that blows no good."

Students in Sam Houston Elementary School at Baytown, Tex., near Houston, have good reason to believe this old adage. School was closed last week when a drilling well within a few feet of the school building blew out.

The blowout occurred when pressures higher than those common in the Baytown field were encountered. Normal surface pressure is 500 psi. and the well was equipped with a 2,000-psi. blowout preventer. However, pressures estimated at 4,000 psi. were hit.

Penrod Drilling Co., one of several concerns owned by the fabulous H. L. Hunt of Dallas, has entered the field of public opinion. In a good-sized ad in a Houston newspaper, the company has published the names, radio stations, and broadcast times of 10 national commentators and urged the citizenry to listen.

The ad concludes with a small plug for Penrod Drilling Co. and the slogan: "We will drill your wells." The company headquarters in Shreveport and C. M. Roberson is drilling superintendent.

George Holden, engineer for the Louisiana Conservation Department, tells The Oil and Gas Journal that he believes the term "secondary recovery" is a poor one. He suggests "induced permeation." Unfortunately your reporter had no dictionary on this trip so you'll have to look the words up yourself.

Jim Clark, Glenn McCarthy's former publicity man, has announced that Michel T. Halbouty, well-known Houston geologist, will collaborate with him on a book concerning Spindletop. It will be published by Random House. Two titles are being considered: "Spindletop" and "Hell on the Hill."

A shyster used the good name of a major oil company recently in New Orleans to "slicker" a number of firms out of considerable cash and merchandise. In a story which was widely reported in the press, he simply had calling cards printed which purported him to be district manager for the oil company. He then visited various places of business—with a different story at each—and proceeded to garner his cash and merchandise. One merchant still insists the man is legitimate—"After all, he had a calling card."

MIDDLE EAST

Iranian Workers Strike

Anglo-Iranian's reduction of living allowances, plus oil-nationalization decision intensify demonstrations

Dahl M. Duff

THE scattered strikes occurring last week in the Anglo-Iranian Oil Co., Ltd., concession in Iran followed the usual pattern of demonstrations at the time of the Persian New Year, though in this instance touched off by a company decision to reduce living allowances and intensified by popular feeling over the oil-nationalization issue.

There were walkouts reported at the Bandar Mashur loading dock, at Masjid-i-Sulaiman, and at Agha Jari field. Toward the end of the week it was estimated some 12,000 of the 80,000 oil workers were idle. A company spokesman in Teheran, the Iranian capital, however, said the situation at Abadan was normal and that production, refining, and loading operations were proceeding as usual.

Reports indicated that the company under government urging had undertaken to reduce the difference between the pay and allowances of its employes and the considerably lower pay of workers in other Iranian industries, such as textiles. Details of this development were not clear, but it was obvious Communist elements were exploiting every opportunity to foment disturbances not only in the oil operations but elsewhere in the country.

The serious international implications of Iran's plan to nationalize the British-owned company were made apparent in a speech in London by British Defense Minister Emanuel Shinwell. Warning against attempts to "twist the British lion's tail," he said Britain would not be party to "violation of agreements willingly entered into between one country and another." British interests, he said, must be safeguarded in any part of the world, and in particular, the country's oil interests must be protected because they are a vital part of Britain's industrial life."

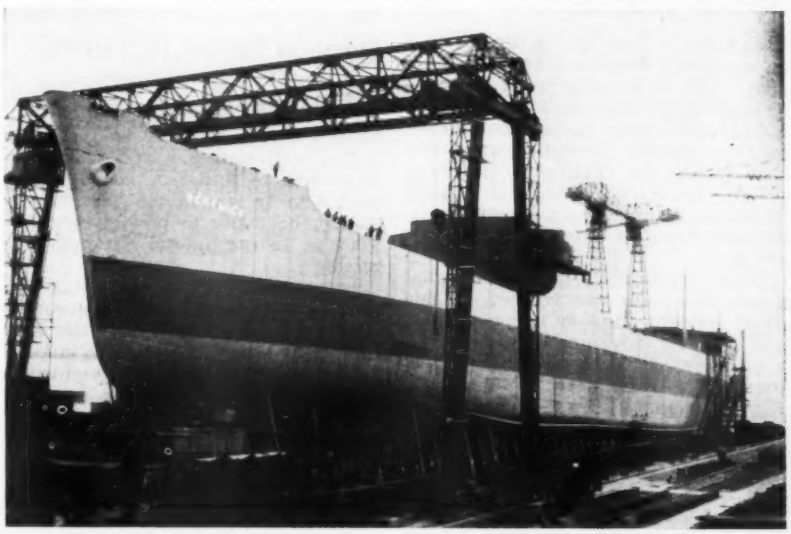
Martial law extended.—Martial law was extended to other sections of Iran last week, and with the New Year holidays, the outburst of nationalistic fervor that reached its climax with the parliamentary vote on oil nationalization appeared to be subsiding. The Majlis, or lower house, oil committee presumably was preparing to proceed with its 2-months' study of ways to implement the proposal.

There has been some concern among United States oil-company officials over the developments in Iran, particularly since the nationalization move can be expected to lead to similar attempts elsewhere in the Middle East and Southeast Asia. One informed official in New York pointed out, however, that exactly what the Iranians mean by nationalization has not yet been clearly spelled out, at least in public reports reaching this country. He said nationalization varies from the extreme of confiscation such as took place in eastern Europe, through expropriation such as happened in two Latin American countries, and on down to milder forms of government participation, including profit sharing, board representation, and a domestically registered company.

Seizure talked.—Despite this, all reports showed that some of the members of the Iranian Parliament at least have in mind full-fledged government seizure of the company. The contention is that the 1933 concession agreement is invalid since it was negotiated under duress and when Iran was ruled by the dictator, Reza Shah. How the Iranian Government, already verging on bankruptcy and deeply in debt to the company on advance royalties, could pay for the properties apparently was not considered, or at least worked out, during the frenzy of feeling accompanying the parliamentary vote.

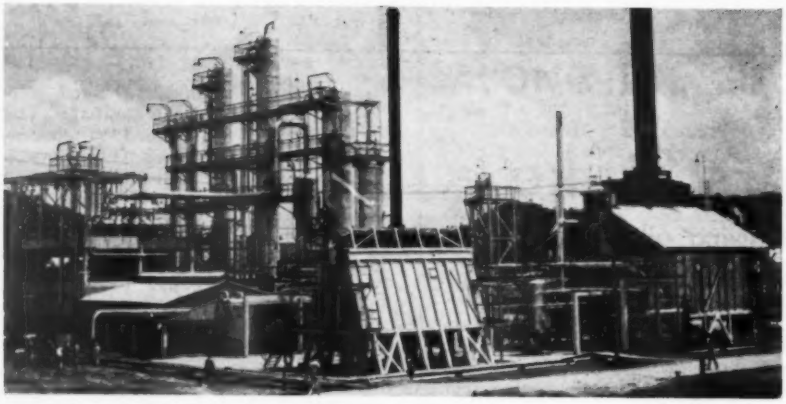
Deadlock.—In its March 24 issue, The London Economist commented that the situation now looks like a deadlock and that the danger lies in the possibility a pause for cooler thinking will not occur and "Teheran temperatures remain at their present height." Arbitration of the differences between the government and the company in theory is the next step, but the Iranians in their present mood may well refuse to do this.

The Economist referred to the "50-50" agreement between Saudi Arabia and Arabian American Oil Co. and commented that "a careful assessment of the very different basis on which the two agreements (that in Saudi Arabia and the 1949 offer of Anglo-Iranian to the Iranian Government) were conceived would probably show that, in any bad year, the



New French Tanker Launched

This giant vessel, ranking as one of the world's largest tankers, was launched recently at the Penhoet Shipyards in Saint Nazaire, France. Named the Berenice, the ship is of 31,550 tons. It was built for Cie. Auxiliaire de Navigation and will be chartered by Cie. Francaise des Petroles for the movement of crude oil from the Middle East and Eastern Mediterranean to the French refineries of C.F.P.'s subsidiary, Cie. Francaise de Raffinage. Cargo capacity of the Berenice is 39,000 cu. m., or about 245,000 bbl. A sistership, the Bethsabee, is under construction and due to be launched in about 6 months. These ships have a speed, fully loaded, of 15½ knots.



Brazilian Refinery Placed on Stream

This new refinery, the first to produce cracked gasoline in Brazil, was recently placed on stream at Bahia, Brazil, for Refinaria Nacional de Petroleo, S. A., by M. W. Kellogg Co. The refinery, a complete combination crude-distillation and thermal cracking plant, is capable of processing 2,500 bbl. of crude daily, and is the first of its kind to be built in Brazil.

Anglo-Iranian supplement agreement was the better offer." It was critical of Anglo-Iranian for failing to explain the advantages of its 1949 offer to the Persian people, and said that though the company does a great deal for Persia, it takes the line that "we are busy oil men, with a job of extraction to do, and we have no time for scenes; too few of its staff speak Persian well, or have been outside the oil-field and refinery areas."

Neutral Zone Test Fails

Fuwaris 1, the fourth test drilled in the Saudi Arabian-Kuwait Neutral Zone, has been abandoned as nonproductive at about 9,400 ft.

The exploratory work is being carried on jointly by American Independent Oil Co. holding a concession on the Kuwait interest, and Pacific Western Oil Co., which has rights in the zone from the Saudi Arabian Government.

Three contract-reflection seismograph crews are now working in the area, and the data is being studied and the rig revamped before proceeding with further drilling. The previous drilling near the northern Kuwait boundary has been largely on a basis of gravity-meter work, and the exploration is now being extended to the south and east toward the Persian Gulf.

Drilling is being done jointly by Brown Drilling Co. and Kerr-McGee Oil Industries, Inc. The fourth hole now abandoned was the deepest of any of the tests and went considerably below what was believed to be the limit of the equipment used.

Trucial Test Suspended

The first exploratory well to be drilled on the Trucial Coast of the Persian Gulf has been suspended.

The well, located on the Ras Sedr structure in the shiekhdom of Abu Dhabi, went to 13,001 ft. without finding production. The concession is held by Petroleum Development (Trucial Coast), Ltd., which is associated with Iraq Petroleum Co., Ltd., through Petroleum Concessions, Ltd.

The I.P.C. organization is now rigging up to spud in another Trucial Coast wildcat on the Djebel structure in the neighboring shiekhdom of Dubai. Another rig has been moved in for this test.

Burghan Test at 12,240 Ft.

Kuwait Oil Co., Ltd.'s deep test in Burghan field last week was reported drilling below 12,240 ft.

The well now has about 3,000 ft. of open hole, and 5-in. casing is expected to be run in the near future. It may be taken to possibly another 1,000 ft. to reach total depth before testing.

The operation is regarded as one of the most important exploratory ventures now under way in the Persian Gulf area. The well is investigating the possibility of production below the present Burghan sands at from 3,500 to 4,800 ft.

Pipe Line Cuts Suez Traffic

Figures from the Suez Canal Co. in Paris show the initial effect on canal traffic of the opening of the Trans-Arabian pipe line from the Persian Gulf to the Eastern Mediterranean.

First shipments from the newly completed Tapline were made out of the Sidon, Lebanon, terminal on December 2. In that month, the canal company's report shows, petroleum traffic through the canal from Saudi Arabia dropped to 831,000 tons against 1,253,000 tons in November 1950 and 1,069,000 tons in December 1949.

As a result, Saudi Arabia, which had been the leading petroleum-exporting country using the canal, dropped to third place during the first partial month of pipe-line operation. Despite the drop in shipments from Saudi Arabia, over-all canal traffic rose from 7,158,000 tons in November to 7,393,000 tons in December, with 3,807,000 tons of the December total made of south-to-north shipments which are largely petroleum. The north-south movement rose sharply due to increased shipments of metals, grain, fertilizer, and sugar.

Capacity of the Trans-Arabian line indicates a further sharp decline in tanker traffic passing through the canal from Saudi Arabia. The line's capacity of 300,000 bbl. daily is equivalent to about 1,290,000 tons a month, or more than the entire Saudi Arabia movement through the canal last November. During December Sidon shipments averaged only about 120,000 bbl. daily *(The Oil and Gas Journal, January 25, page 176)*, indicating throughput of the line was far below capacity during the first partial month of operation.

EUROPE

Romanian Turmoil

Military takes control of country's oil fields

DETERIORATION of the oil industry in Romania was reflected in the recent disclosure that military authorities have taken control of the country's oil fields following dismissal of the mines and petroleum minister.

The mines and petroleum minister, Gheorghe Vasilichi, was ousted because of failure to meet production goals. Three other ministers of the Communist regime were dismissed at the same time, indicating a serious economic situation in Romania, not only in oil but in other fields.

The assumption of control of the oil industry by the military was reported by the Belgrade radio in Yugoslavia. The earlier reports of the dismissal of the ministers came from the Yugoslav news agency.

Oil production.—The reports said that current oil production in Romania is barely 4,000,000 tons, or less than 82,000 bbl. daily. If correct, this bears out estimates generally made by industry sources in this country. The reports are in sharp contrast to a recent statement issued by the Romanian Legation in Washington claiming percentage gains in petroleum production which would indicate an output of between 100,000 and 125,000 bbl. daily.

Prewar, the Romanian oil industry,

largely operated by United States and British interests, had a production reaching about 175,000 bbl. daily in 1936, and was the most important in Europe. It was nationalized by the Communist Government in June 1948. Most of the production since the war has been taken by the Russians as a form of war reparations.

Shortages.—Equipment shortages and resistance of the workers to the Communist system and Russian control are believed to be the main reasons for the decline of the Romanian industry. Many Romanian oil installations were dismantled and removed to Russia. For a time, some equipment was being received from Czechoslovakia but it was insufficient in quantity and of poor quality.

The Communist 5-year plan, set up in cooperation with the Soviet Government, called for a further increase of 19.6 per cent in oil production in 1951. *(The Oil and Gas Journal, February 15, page 65).* Under the plan, production was to reach 200,000 bbl. daily in 1955.

French Exploration

Jersey affiliate given authority for oil search

THE application of Standard Francaise des Petroles (Standard Oil Co. [N. J.]) to explore for oil in Southwest France has been approved by the French Government.

The action marks the first participation by private foreign capital in the extensive search for production carried on for the last 5 years in metropolitan France.

The exploratory concession obtained by S.F.P. covers 4,300,000 acres in the region of Bordeaux. The permit was granted by the French Ministry of Industry and Commerce, good for a period of 5 years with the possibility of extensions.

To start immediately.—S.F.P. expects to begin geological and geophysical work immediately in the area. Under the French mining law, terms for any subsequent exploitation concession, provided production is found, are to be negotiated later.

The application for the concession has been pending for several years. S.F.P., which operates the Port Jerome refinery, one of France's largest, has heretofore been an importing, refining, and marketing company. The company is controlled by Jersey Standard, and minority stock is publicly traded in France.

The exploration program carried on in the French Union since the end of the war is considered to be the largest sustained effort of its kind outside the United States and Canada. Aside from the majority interest held by Shell and Gulf in two separate companies given concessions about a year ago in Tunisia, the work in metropolitan France and its overseas territories has been conducted by wholly or partially owned government companies.

Lacq discovery.—A year ago, Soc. Nationale des Petroles d'Aquitaine made the only postwar discovery of significance in France. This was at Lacq in the foothills of the Pyrenees. *(The Oil and Gas Journal, December 21, 1950, page 283.)* This discovery is to the south of the new S.F.P. concession area. The field that has since been developed is now producing an estimated 3,000 bbl. daily.

Though France has in the past been generally considered a somewhat unlikely area for exploration, the government-backed program during the last 5 years has resulted in the expenditure of well over $100,000,000. It has been prompted by exchange shortages, security reasons, and the national desire for an independent oil supply.

Long-range effort.—The program being carried out and in which the Jersey Standard organization is now participating is a long-range effort designed to determine thoroughly the chances of major production in the country and its territories. The Bureau des Recherches de Petrole, which is responsible for promoting the French exploration, has drawn up a second 5-year plan which has been examined by a commission of the French Parliament. The program is still under discussion. B.R.P. outlined the expenditure of 50 billion francs (equivalent to about $140,000,000) and suggested the purchase of 30 more rigs. This outlay would cover not only metropolitan France but also the overseas territory—Algeria, French Morocco, Gabon, French Cameroons, Madagascar, and Tunisia—where exploration for oil also is under way.

Refinery to Be Rebuilt

The reconstruction and expansion into a modern refinery of war-damaged facilities of Ruhrchemie, A.G., at Oberhausen-Holten has been approved by the Security Board in western Germany.

The new plant will be built around existing distillation and cracking units, and a reformer will be added for improving motor-fuel quality. On completion of the program, the refinery will be able to process about 5,000 bbl. daily with a cracking capacity of approximately 2,000 bbl. daily.

Koch Engineering Co., Wichita, Kans., has been engaged to build the cracking plant. Middle East crude will be used in the refinery, and the entire project is to be carried out without public or European Recovery Program counterpart funds.

Another current German refinery project is the new plant of about 2,000 bbl. daily capacity to be erected at Muelheim on Ruhr by Ruhrbau, G.m.b.H., a company jointly organized by Braunkohle Benzin A.G. (Brabag) and the Stinnes group. Completion of the first stage by the middle of this year is anticipated.

Parts of a shutdown shale-oil-retorting plant at Balingen in Wuerttemberg will be used. It is planned later to add possibly another 2,000 bbl. daily of capacity as well as cracking units. Up to the end of the war the Brabag company, with its hydrogenation and synthetic-fuel plants, was the largest German producer of motor fuels.

W.P.C. Drilling Papers

Included in the total list of 46 papers on drilling and production subjects which will be covered at the Third World Petroleum Congress at The Hague, the Netherlands, May 28-June 6, will be the following (all papers will be distributed in preprint form at the congress):

"Internal Hydrostatic Pressure Testing as a Measure of the Performance Values of Oil Well Casing and Tubing," H. G. Texter, U.S.A.; "A Drillability Classification of Geological Formations," A. L. Head, Jr., U.S.A.; "Theoretical Considerations Involved in the Determination of Petroleum Reservoir Parameters From Electric Log Data," M. R. J. Wyllie, U.S.A.; "Oil Base Drilling Fluids," George Miller, U.S.A.; "Standards for Casing Centralizer Tests," W. S. Althouse, Jr., and E. H. Clark, Jr., U.S.A.

"Effect of Particle Size on Physical Properties of a Gulf Coast Drilling Mud," H. Fancher and S. C. Oliphant, U.S.A.; "Some Problems of Relative Permeability Measurement," Walter Rose, U.S.A.; "Introduction to the Hydraulic Long Stroke Pumping Unit for Pumping Problem Wells," D. M. Jones, U.S.A.; "Drilling and Producing Oil and Gas in the Gulf of Mexico," Leigh S. McCaslin, Jr., U.S.A.; "Diesel Electric Drilling," Howard L. Shatto, U.S.A.; "Determination de la Permeabilitie des Roches a partir de la Pression de Deplacement d'un Fluide Homogene par un Autre," A. Houpeurt and G. Manasterski, France.

"Drilling Emulsions," R. A. Henkes, Venezuela; "Application of Numerical Methods to Cycling and Flooding Problems," C. H. Fay and M. Prats, U.S.A.; "Emulsion Drilling Fluids," Doyne L. Wilson, U.S.A.; "Well Cementation," R. P. Moscrip, U.S.A.; "La Dynamique du Train de Forage," J. P. Bernhard, France; "Cretaceous Limestone Producing Areas of the Mara and Maracaibo Districts," M. Stephenson, Venezuela; "Solvent Washing of Wells in the Digboi Field, Assam," H. B. Kale, J. Wyllie, and H. R. Tainish, India; "Exploitation of Oilfields of Extremely High Oil-Viscosity by Wells, Under Application of Thermal Energy," A. K. Winkler, Austria; "Information on Hydrafrac Process," J. C. Padgett, U.S.A.; "Apparent and Actual Minimum Connate Water Content of Oil Reservoir Rocks," Dr. Walter Ruehl, Germany.

"Latest Developments and Achievements of Directional Drilling in Exploitation of Oil Fields," H. J. Eastman, U.S.A.; "Electrical Logging in Limestone Fields," H. G. Doll and M. Martin, U.S.A.; "Polytropic Flow in Gas Wells," H. Power and J. Coull, U.S.A.; "Theoretical Considerations of Multiphase Flow in Idealized Capillary Systems," S. T. Yuster, U.S.A.; "Techniques in the Kirkuk Oil Field," H. A. Freeman, U.K.; "The Poza Rica Field," Jose Colombo and Alfonso Barnetche, Mexico; "Oil Recovery by Fluid Injection," Paul D. Torrey, U.S.A.

Winter Fails to Hinder Construction Work

Despite snow and winter weather, work continues on the construction of new facilities at the Llandarcy, South Wales, refinery of Anglo-Iranian Oil Co., Ltd. Shown here is the partially erected vacuum distillation unit. This 17,000-bbl. unit will provide feed stocks for the lubricating-oil plant and catalytic cracker. The Llandarcy refinery project (The Oil and Gas Journal, December 21, 1950, page 253) is a major part of the program to increase refining capacity of the United Kingdom to about 400,000 bbl. daily. (Anglo-Iranian photo.)

Grangemouth Work

Distillation facilities being prepared for use

NEW distillation equipment at the Grangemouth, Scotland, refinery of the Anglo-Iranian Oil Co., Ltd., organization is now being tested and prepared for use.

In April, the capacity of the refinery will be raised to 1,800,000 tons a year as a result of the plant improvements and completion of the 12-in., 60-mile pipe line now being laid across Scotland to supply crude to the refinery.

The 1,800,000-ton capacity, or approximately 36,000 bbl. daily, is triple the present rating. The plant had a capacity of 360,000 tons a year prewar and this was increased last year to about 600,000 tons by modifications.

Begun in 1949.—Work on the new distillation unit began early in 1949. Construction is continuing on other facilities to improve product quality and range. New administrative buildings, laboratories, boiler house, and a generating plant are being added. A total of 160 employe houses are being added to the 100 already existing.

Hitherto crude for Grangemouth has been brought in by tanker on the Firth of Forth. The new line, however, will give access to deeper water in Loch Long on the west coast of Scotland, thus allowing the refinery to be supplied by the largest-size vessels. The pipe line which is being built across Scotland is the only crude trunk line in Great Britain, though pipe lines were used extensively to move products during the war.

Part of big program.—The refinery expansion and pipe-line construction are a part of a £17,500,000 program of expansion undertaken by Anglo-Iranian in Scotland. Adjoining Grangemouth and now nearing completion is the plant of British Petroleum Chemicals Ltd., a joint company of Anglo-Iranian and Distiller Co. Production from this plant will include industrial alcohol which will relieve the shortage of molasses in Britain. Another plant to be built near the refinery will be that of Forth Chemicals, Ltd., jointly owned by British Petroleum Chemicals and Monsanto Chemicals. It will produce monomeric styrene for the plastics industry.

The Grangemouth refinery is owned by Scottish Oils, Ltd., an Anglo-Iranian subsidiary. The original refinery was built in 1924. On completion of the present program, it will take a place as one of the most modern processing units in the United Kingdom.

ECA to Finance Program

A search for oil in the American and British zones of Austria, all of whose present production is in the Soviet-controlled zone and is largely taken out of the country by the Russians, will be financed with ECA funds.

An authorization of up to $442,000 in Marshall-plan dollars to finance the cost of drilling equipment has been granted by ECA for Rohoel-Gewinnungs Aktiengesellschaft, a subsidiary of Socony-Vacuum Oil Co., Inc., New York, and Royal Dutch-Shell, The Hague, which has been making preliminary surveys in various areas.

ECA pointed out that if oil is discovered in sufficient quantities in western Austria, the country could become independent from the supply from the eastern area and also save dollars now being spent for oil imports. The presence of worthwhile reserves in the American and British zones has long been assumed, since the region contains the same strata which run eastward from the Bavarian oil fields into those of eastern Austria.

It was explained that the work will require heavy drilling rigs not available in Austria because a large portion of the region is covered by glacial deposits which are difficult to penetrate. The ECA funds will be used for the purchase of a rig of the type needed, as well as other United States equipment, including draw works, drilling line, two oil-well slush pumps, four shale shakers, and spare parts.

Some exploratory equipment for the Austrian drilling program has already been supplied under two ECA authorizations previously issued. Those authorizations amounted to $140,000 and provided two exploratory rigs and one seismograph unit.

AFRICA

Synthesis Plant

Gasoline-from-coal unit to be built by Kellogg

PLANS to start construction within the near future on the coal-to-gasoline synthesis plant to be built in South Africa have been announced by M. W. Kellogg Co.

The plant is being engineered and built for South African Coal, Oil & Gas Corp., Ltd. It will be the world's first modern, commercial gasoline-from-coal plant and the largest industrial project to be undertaken in South Africa since the last war, Kellogg said.

The installation will be located adjacent to the Vaal River, near the town of Coalbrook in the Orange Free State, about 40 miles south of Johannesburg. The project is an integrated plant which embraces the opening of virgin coal deposits, construction of aboveground gasification facilities to transform coal to synthesis gas, and the complete syn-

thesis plant to produce liquid hydrocarbons.

To use Synthol process. — The plant will utilize Kellogg's Synthol process on which the company started research and development work in the thirties. Within the last few years, this work has produced a radically new type of reactor to handle powdered catalyst as well as new fundamental operating conditions. These developments have been thoroughly tested in the company's pilot plant in Jersey City, the announcement said.

High-octane-gasoline processes such as catalytic polymerization will form a part of the plant facilities. Byproducts of the new plant will be alcohols and oxygenated chemicals suitable for solvents and other uses. Kellogg will act as over-all project manager and will have complete technical direction as well as responsibility for the design and engineering of process facilities. Its subsidiary, Kellogg International Corp., will handle procurement and supervision of construction.

"The new SASOL Synthol plant, culmination of many years of planning by South African Government and private interests, is primarily designed to produce liquid fuels—gasoline and diesel oil—in volume," the announcement said. "While South Africa does not possess any major indigenous-petroleum reserves, it does have tremendous deposits of coal available at low cost. Through use of the Synthol process, it is believed that these deposits can be utilized to make the country largely independent in the matter of liquid fuels."

Equipment.—Some indication of the physical size of the plant, Kellogg said, can be gained from the fact that one of the several gas generators, used to transform coal into process gas, would supply the domestic needs of a United States city of 150,000 people. The entire project encompasses sinking of coal shafts, installation of coal-conveying and grading machinery, complete chemical-processing plant, including bulk-oxygen production, product-handling equipment, including tank farm, complete road net, and in addition, an entire village to house employes.

The synthesis plant is the second petroleum manufacturing project announced for South Africa in recent weeks. Standard-Vacuum Oil Co. late in February disclosed plans to construct a 10,000-bbl. daily refinery at Durban which will use imported crude oil.

Long studied.—The synthesis plant has long been studied in South Africa as a means of utilizing the country's coal deposits. In the Coalbrook district, coal is at an average depth of 400 ft. with seams ranging in thickness from 10 to 20 ft. The coal which is to be used is mined at a pithead price equivalent to less than $1 a ton.

Prospect Licenses

Four firms take permits for Pakistan exploration

PROSPECTING and exploration licences under the 1949 petroleum rules have been taken out in Pakistan by three British-affiliated companies, while one unidentified American company is reported seeking government permission to carry out aeromagnetic surveys.

The companies receiving licenses are firms recently incorporated in Pakistan as required by the petroleum rules. They are: Pakistan Petroleum Co., Ltd. (Burmah Oil Co., Ltd.), Pakistan Oilfield Co., Ltd. (Attock Oil Co., Ltd.), and a subsidiary of Indo-Burma Oil Co., Ltd. These companies were granted 32 prospecting licenses and four exploration licenses.

Production. — The Pakistan Government's Ministry of Industries recently announced that production in the country in the first half of 1950 amounted to 539,493 bbl., or an average of about 2,980 bbl. daily. All this comes from a group of four small fields in the Punjab in West Pakistan.

Of the first-half 1950 production, 338,868 bbl. came from Attock Oil's properties in Attock and Jhelum districts, and 200,625 bbl. from B.O.C.'s Chakwal 2 well in Jhelum district. By comparison, Pakistan's entire production of all of 1949 was 823,550 bbl., and in 1948, 425,553 bbl.

American firm.—The American company reported to have approached the Pakistan Government was said to be interested in the Bengal Basin to do preliminary reconnaissance. Standard-Vacuum Oil Co., principal American company operating in Southeast Asia, was disclosed about a year ago to be considering exploration in eastern India.

Under Pakistan's petroleum rules, exploration licenses good for a basic 3-year period, lead to a prospecting license and then in case of production to the full-oil mining lease. The area for a single prospecting license is normally limited to 100 sq. miles while the exploration license cover up to 5,000 sq. miles.

Active company.—Most active operator in exploratory work in Pakistan has been the B.O.C. organization. Its new company, Pakistan Petroleum, is to work prospecting-license areas in the Chak Naurang and Bakhri sections of Punjab and mining leases at Balkassar, also in the Punjab, and Patharia, in the Sylhet District of East Pakistan. Arrangements already have been made to start drilling in Patharia.

Pakistan Oilfield has been granted 8 prospecting licenses over 148 sq. miles in Punjab Province. The Indo-Burma company has received seven licenses for the Kohat district of Pakistan's Frontier Province.

Pakistan Petroleum has an exploration license over about 5,000 sq. miles in the district of Sylhet and adjoining districts in East Pakistan. Two exploration licenses have been granted to Pakistan Oilfield over 1,570 sq. miles in the Frontier Province and the Punjab. Indo-Burma's company has an exploration license for 774 sq. miles in the Frontier Province.

Assam Continues Program

Assam Oil Co., Ltd., is continuing its exploratory program in eastern India with preparations for a new test well at Nichuguard in the Naga Hills jungle of Assam.

The Burmah Oil Co., Ltd., subsidiary hopes to begin drilling by May. An engineering party from the company's headquarters at Digboi in Upper Assum has cleared the site for the well. The location is 9 miles from Manipur Road, a town on the Assam Railway, northeast of Calcutta and near the border towns of Kohima and Imphal.

A modern diesel-driven rig will be used for the Nichuguard operation. A camp for the crew and other workers is being set up near the well. The Assam company's previous test at Barsilla in Sibsagar District of Assam was completed as nonproductive last fall. Slight oil shows were encountered but the quantities were noncommercial. In October 1949, another wildcat drilled by Assam Oil in the Tiru Hills of Assam failed to find oil.

Burma Refinery to Be Moved

Burmah Oil Co., Ltd., has announced in Rangoon that plans are being made to ship a two-stage distillation unit and other refinery equipment to Chauk field in Central Burma.

The company said the plant would take 15 to 18 months to move and erect and when in operation would allow more complete refining in the Central Burma oil fields. As a result, it is expected that Burma's dependence on imported products will be lessened.

Atmospheric and vacuum towers for the distillation unit have been dismantled into sections for transport to Chauk by river barges from the Rangoon area. In addition, the company said a certain amount of new drilling will be undertaken shortly

(Continued on page 145)

PERSONALS

Production Expert

Ivan S. Salnikov joined Jersey Standard in 1944

WIDELY known as a specialist in the field of production and drilling equipment, Ivan S. Salnikov since 1944 has been a member of the staff of the producing-coordination department of Standard Oil Co. (N. J.) in New York.

In this capacity he assists the Jersey company's affiliates, both foreign and domestic, with their petroleum-engineering problems and production and drilling requirements.

Salnikov joined Carter Oil Co. in Tulsa immediately after his graduation in 1925 from Colorado School of Mines with a degree in petroleum engineering. He filled a variety of jobs during his 19 years of service with that company.

The first 2 years with Carter he worked as roustabout and chemist in the gasoline department. From 1927 to 1935 he served in the production department as production engineer and division engineer in Seminole, Okla. The next 2 years were spent supervising the drilling and development of the South Burbank, Oklahoma, unit.

Besides South Burbank and Seminole, Salnikov participated in the development of Cromwell, Oklahoma City, and Loudon fields. In 1939, he became chief engineer of Carter and continued in that capacity until his move to New York to the producing-coordination staff of the parent company.

J. C. Dennis, foreman in the Palestine area, Anderson County, Texas, in charge of gas and cycling operations on properties owned jointly by Tide Water Oil Co. and Seaboard Oil Co. of Delaware, has been transferred to Houston as chief engineer of the gas-utilization department to replace **R. D. Stanwood** who resigned. **J. R. Mason,** assistant foreman, will replace Dennis as foreman in the Palestine area; and **M. D. Temple,** gas engineer, becomes assistant foreman replacing Mason. **J. R. Motley,** associate engineer, will be advanced to gas engineer.

Alec M. Crowell has taken a leave from Natural Gas Associated Consultants, New Orleans, to be chief of the fuel and chemical section, New Orleans district, for the Office of Price Stabilization. Crowell, who opened petroleum-consulting offices in Shreveport and New Orleans 7 years ago, is still an active oil and gas producer in Arkansas, Texas, Louisiana, and Mississippi. He is one of the founders of Texas Eastern Transmission Corp., Texas-Illinois Natural Gas Pipeline Co., Delta Power & Gas Co., and Industrial Gas of Louisiana, Inc.

W. L. Kennedy, Jr., planning engineer with Service Pipe Line Co., has been named senior engineer, succeeding **V. J. Sittel,** who was named assistant chief engineer. Kennedy has been with the firm since 1946.

Jack Clarke, formerly assistant to the chairman of the board of Lion Oil Co., El Dorado, Ark., has joined Texas Eastern Transmission Corp. as director of public relations with offices at Shreveport. He has been closely associated with the oil and gas industry since 1938 when he joined Lion Oil. Clarke is an active member of the Texas Mid-Continent Oil and Gas Association, the Independent Petroleum Association of America, and the National and Arkansas Oil Industry Information Committees of the American Petroleum Institute.

George W. Strake, West Texas oil operator, has moved his district headquarters from San Angelo, Tex., to Winters, Tex. Others making the transfer are **Wayne Larsh,** district superintendent, and **Ralph Crockett,** Ballinger, Tex., who will be office manager.

William W. Guitteau has been appointed manager of supplies for Allied Oil Co., of Cleveland. He was formerly acting manager of the department.

William F. Blain, formerly with Roosevelt Oil & Refining Co., Mount Pleasant, Mich., has joined Bay Refining Corp., Saginaw, Mich., as head of the firm's crude-oil-procurement division.

Warren B. Scobey, formerly with the geological staff of Magnolia Petroleum Co.'s West Texas district at Midland, Tex., has joined Ralph Lowe Interests, and associated concerns at Midland as geologist.

A. T. Sindel, Jr., petroleum engineer for Bay Petroleum Corp., has been transferred from Seminole, Tex., to Oklahoma City.

Robert Davenport, party chief for Amerada Petroleum Corp. at Commerce, Tex., has been transferred to Alexandria, La., in the same capacity.

William J. McBride, formerly refinery engineer for Consumers Cooperative Refinery Association at Levelland, Tex., has joined Eastern States Petroleum Co. at Houston as refinery engineer.

Gus A. Standish, petroleum engineer for Magnolia Petroleum Co., has been transferred from the firm's Lake Charles, La., district to the Gulf Coast offices at Houston. **Clarence Wells, Jr.,** petroleum engineering assistant at Shreveport, has been transferred to the Kermit, Tex., district, and **Dee F. Pendley, Jr.,** petroleum engineer in the Electra, Tex., district, has been transferred to the Kermit producing district with headquarters at Midland, Tex.

Kenneth M. Lawrence has been named chief geophysicist for Amerada Petroleum Corp. at Tulsa. He joined the firm in 1929 as a member of a seismograph field party in East Texas field.

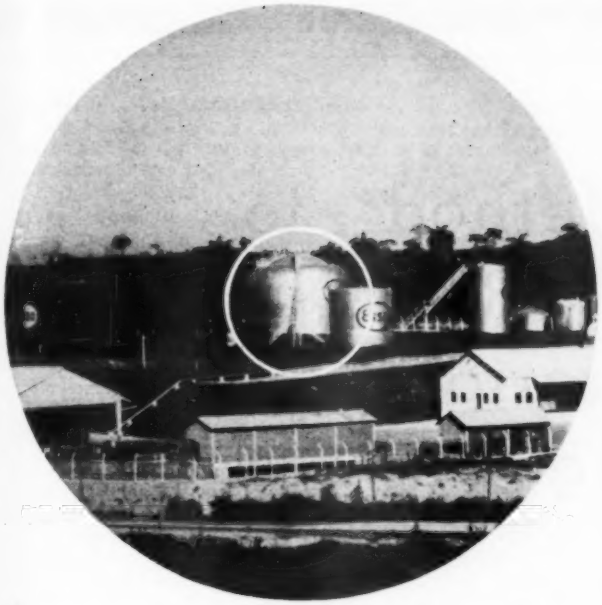
F. A. Thurman, formerly district geologist for Pure Oil Co. at Casper, Wyo., has joined Lion Oil Co. at Denver as Rocky Mountain division engineer.

William C. Wunnicke, petroleum engineer in the San Juan basin for Stanolind Oil & Gas Co., has been transferred to Hobbs, N. M., as field engineer.

J. B. Holt, district production superintendent for Bay Petroleum Corp., has been transferred from Wichita Falls to Bay, Tex., in the same capacity.

L. F. Stratton, formerly with Baash-Ross Tool Co., Houston, has joined Ruhl Drilling Co., Inc. Stratton was with Shell Oil Co. for 15 years as su-

XUM



Above: Esso Standard Oil Company's bulk plant at Belo-Horizonte, Brazil, which serves the state of Minas Gerais. The tank inside the small circle is a NODED Hemispheroid.

Below: View of the Esso Standard Oil Company's ocean terminal at Salvador, Brazil. The tanks inside the left and center circles are PLAIN Hemispheroids. The one at the right is a NODED Hemispheroid. Noded Hemispheroids are built in capacities up to 30,000 bbls.

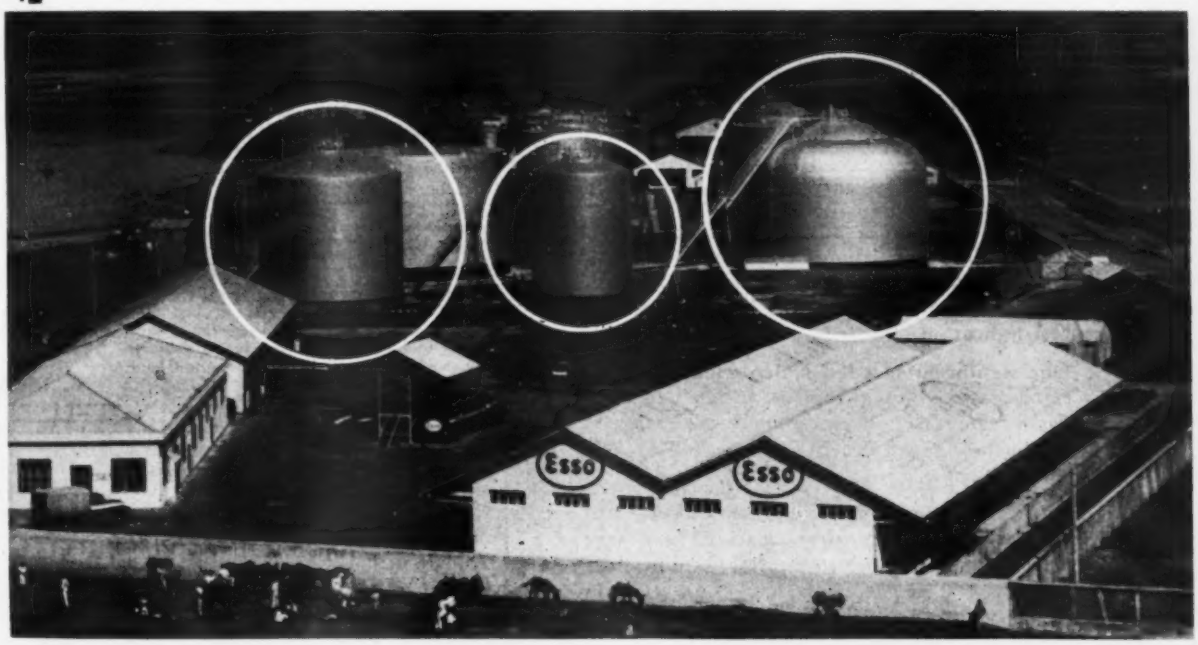
Storage in HEMISPHEROIDS means better gasoline for Brazil's growing demand

BRAZIL—like many other countries all over the world—is using more and more gasoline. For example, the consumption of automobile gasoline in Brazil increased from 585,064,000 liters in 1940 to 1,413,474,000 liters in 1948.

The increased demand for gasoline places added emphasis on the need for using the proper type of storage tanks. The light fractions escape readily from tanks operating at atmospheric pressure . . . and their loss robs a gasoline of its easy starting and anti-knock properties.

The accompanying illustrations show that the Horton *Hemispheroid* is solving this problem at gasoline bulk plants in Brazil. The use of the Hemispheroid means *better* gasoline because it stops the escape of the lighter components. It also cuts down the amount of corrosion on the inside of the tank and reduces the fire hazard during the storage period.

By preventing the loss of light components, Hemispheroids mean *better* gasoline at your bulk stations. Write our nearest office for details.



CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3.....2154 Healey Bldg
Birmingham, 1.....1536 North 50th St.
Boston, 10.....1025—201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Houston, 2.....2119 National Standard Bldg.
Los Angeles, 17.....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
Philadelphia, 3.....1615—1700 Walnut Street Bldg.
Salt Lake City, 4.....525 West 17th South St.
San Francisco, 4.....1554—200 Bush St.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg.
Washington 6, D. C.....1139 Cafritz Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Chicago Bridge & Iron Company, Ltd., Apartado 1348, Caracas, Venezuela
Comprimo N.V., Amsterdam—O, Netherlands
Compagnia Tecnica Industrie Petroli, Rome, Italy
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Sociedade Chibridge de Construcoes Ltda., Rio de Janeiro, Brazil

XUM

A New Method* to STOP and PREVENT Fungi Deterioration in Cooling Towers

* *For further details, write for the special report, "Fungi Deterioration of Cooling Tower Lumber."*

IS THIS HAPPENING INSIDE YOUR TOWER?
At left is a typical piece of fungi-destroyed cooling tower lumber, as compared to an infection-free slat with comparable length of service. Insidious in early stages, this cancerous attack is hard to detect — has been, until now, harder to combat.

CONTAGIOUS fungi deterioration in cooling tower lumber can be far advanced before its presence is even suspected. Complete collapse of drift eliminators is sometimes the first indication.

One significant fact led Nalco scientists to the right answer to fungi control: In infected areas, *not a single cooling tower using the Nalco No. 33 Method and Nalco No. 21-S Slimicide Treatment was attacked.*

Further investigation and research indicates that the same treatment, with variations in dosage procedures, effectively *stops* fungi deterioration.

A brief outline of the Nalco Method is given at right. Complete data on dosages and results are yours for the asking.

HOW THE *Nalco* METHOD WORKS

- **Nalco No. 33 Treatment keeps cooling systems scale- and corrosion-free; prevents delignification of cooling tower lumber because *it holds pH values to 6.0 — 6.5*, close to the natural environmental pH of the wood.**
- **Nalco No. 21-S is a powerful slimicide — a synergistic compound of chlorophenolic derivitives; with stabilizing, dispersing and penetrating agents added.**
- **Combined action of Nalco 33 and 21-S, with the resultant low pH, creates a medium in which fungi cannot survive.**
- **Basic treatment procedure to *stop* or *prevent* fungi deterioration is to adjust pH values properly with Nalco No. 33, then shot-feed Nalco No. 21-S at intervals sufficient to keep slime, algae and fungi growths under control.**

NATIONAL ALUMINATE CORPORATION
6242 West 66th Place Chicago 38, Illinois
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THE *Nalco* SYSTEM • Serving the Petroleum Industry through Practical Applied Science

PERSONALS

perintendent, with Halliburton Production Co. for 4 years, and with Arrow Drilling Co. for 4 years as division manager.

Harvey Cash, Jr., assistant to the division manager, of the production department, Oklahoma division, The Texas Co., has been named assistant division manager. **J. A. Bermingham, Jr.,** division petroleum engineer, succeeds Cash as assistant to the division manager, and **C. F. Elder,** assistant division petroleum engineer, has been appointed division petroleum engineer. Cash joined the firm in 1933 shortly after graduating from Texas A. & M. College. In 1934 he was named computer on a field geophysical party, and appointed supervisor of field operations in 1946. He served as a petroleum engineer with South Texas division until he was transferred to the Oklahoma division in 1949. Bermingham, who joined the firm in 1934 after graduating from University of Southern California, started as assistant petroleum engineer (trainee) in the Los Angeles basin, and was named district petroleum engineer at Santa Paula, Calif., in 1940. In 1942 he was transferred to the Illinois district as district petroleum engineer. In 1943 he was transferred to Tulsa, was named assistant division petroleum engineer in 1944, and division engineer in 1946. Elder joined Texaco as a laborer in the Illinois district in 1940, and has been assistant division petroleum engineer since 1946.

Paul D. Sweitzer, formerly a student at University of Texas, has joined The Texas Co. at Jal, N. M., as roustabout engineer.

Arthur D. Hyde has been elected a director of Northern Natural Gas Co.

John C. Olsen has been elected treasurer of Exploration Surveys, Inc., at Dallas.

Robert A. Dean, formerly development geologist with Standard Oil Co. of Texas at Gainesville, Tex., has joined **Travis B. Dean** as an independent geologist at Abilene, Tex.

Robert M. Lowe, petroleum engineer for Sohio Petroleum Co. at Oklahoma City, has been transferred to Houston as production engineer.

Thomas H. Evans has been appointed assistant to the vice president in charge of operations for Equitable Gas Co. He joined the firm in 1937 after attending the University of Pittsburgh. He is president of the Pittsburgh Purveyors Association, and a member of American Gas Association and Pennsylvania Natural Gas Men's Association.

Robert T. Haslam, former director of Standard Oil Co. (N. J.) and now president of United States Pipe Line Co., has been elected a director of the American Gas & Electric Co. Haslam also is a director of Ethyl Corp., and Worthington Pump & Machinery Corp.

Richard B. Sullivan, Jr., geologist at Shreveport for Sunray Oil Corp., has been named district geologist there.

C. W. Hemmi, seismologist for Petty Geophysical Engineering Co., has been transferred from Junction City, Ark., to Fort Morgan, Colo.

Dr. George H. Fancher, University of Texas professor and director of the Texas Petroleum Research Committee, has been named to the American Petroleum Institute's advisory committee on Southwest production.

Walter B. Spangler and **Jahn J. Peterson,** Esso Standard Oil Co. geologists currently assigned to Creole Petroleum Corp., Caripito, Venezuela, have been announced by **C. L. Moody,** president of the American Association of Petroleum Geologists, as joint winners of the A.A.P.G. President's Award for 1951. The award is made annually to authors under 35 years of age, of the "most significant original contribution to petroleum geology" published in the monthly bulletin of the association during the previous year.

John L. Lenker has been elected chairman of the New York State Oil Industry Information Committee, succeeding **Q. W. Regestein.**

W. T. Shiver, tool pusher for Warren Oil Corp., has been transferred from Wichita Falls to Abilene, Tex., in the same capacity.

W. L. Blansett has been named foreman of the pumping and gaging department of Humble Oil & Refining Co. at Baytown, Tex. He succeeds **Howard E. Humphrey** who has retired.

H. H. Uhlig, head of the Corrosion Laboratory, Massachusetts Institute of Technology, Cambridge, Mass., has been designated to receive the 1951 Willis Rodney Whitney Award, for contributions to the science of corrosion. **Kirk H. Logan,** research engineer of Cast Iron Pipe Research Association, Washington, D. C., will receive the 1951 Frank Newman

SHELL GROUP.—The special policy and review committee of Shell Oil Co. is shown during the firm's 1951 geophysical conference. Left to right: R. C. Kendall, Tulsa; W. Baillie, Canada; A. B. Wood, Colombia; B. Baars, The Hague; L. M. H. Vreugde, Houston; Dr. M. King Hubbert, Houston; T. S. Edrington, Midland, Tex.; W. Hafner and K. R. Weatherburn, Houston; G. A. Burton, New Orleans; J. C. Waterman, Pacific Coast region; and L. K. Mower, Houston.

PERSONALS

Speller Award for contributions to corrosion engineering. The awards are given yearly by National Association of Corrosion Engineers, Houston.

W. A. Disheroon, formerly superintendent of Benjamin, Tex., Lone Star Gas Co.'s compressor station, has been named superintendent of the firm's new compressor station at Snyder, Tex. **P. J. Hurd,** Waco, Tex., compressor-station superintendent, has been transferred to the Benjamin station as superintendent.

Clint A. Darnall, Atlantic Refining Co., has been transferred from Shawnee, Okla., to Dallas as assistant to the regional geologist. Other changes in the firm include: **Alexander C. Walker,** from Syracuse to Watertown, N. Y., as district manager; **Harold G. Alford** to Magnolia, Ark., as junior production engineer; and **Ernest J. Dillard, Jr.,** to Magnolia as seismic party trainee.

Robert N. Kolm, district geologist at San Antonio for Atlantic Refining Co., has been transferred to Dallas as assistant chief geologist. Other promotions include: **Edwin M. Bryan,** to station chief at Midland, Tex.; **Clyde M. Rascoe,** to geologist at Midland; **J. B. Headley, Jr.,** to assistant to the regional geologist at Dallas.

F. C. Jones has been appointed head of the operations department of Phillips Oil Co. in Venezuela. He replaces **Earl Griffin** who has been transferred to Corpus Christi, on an assignment for Phillips.

Marvin S. Jones has been named district land man at Magnolia Petroleum Co.'s Wichita Falls, Tex., district, replacing **H. P. Hodge** who has retired.

John A. Scott, who joined Sinclair Oil & Gas Co. at East Chicago in 1934, has been named to head a new division of the company designed to enlarge its activities in the petroleum chemicals field.

Richard C. Cornelison, formerly with General Electric Co., at Schenectady, N. Y., has joined California Research Corp., research subsidiary of Standard Oil Co. of California, San Francisco. He will engage in research in connection with the company's contract with the Atomic Energy Commission.

H. P. Wenger has been appointed assistant to **William McKay,** production superintendent for Aurora Gasoline Co. at Evansville, Ind. **Robert Loose** has been named assistant to **Everest Wible,** district geologist.

Eddie Bell, who has been long associated with Loffland Brothers, has joined Stansbury, Inc., drilling contractors, at Bakersfield, Calif., as tool pusher.

William Graef, a recent graduate of Ohio State University, is now geologist for Davis Lambert & Johnnie Cline, independent oil firm, at Mount Carmel, Ill.

Jean Jacot, of Direccion des Carburants, French Government oil agency, is now touring oil installations in the Southwest. Jacot arrived in New York from Paris last February to confer with Economic Cooperation Administration officials in Washington.

W. A. Berryman, Gulf Oil Corp.; **W. J. B. Dixon,** The Texas Co.; **Walter L. Faust,** Socony-Vacuum Oil Co., Inc.; **A. A. Garrabrant,** Atlantic Refining Co.; and **John C. Sample,** Standard-Vacuum Oil Co., are among the newly elected directors of the National Foreign Trade Council.

Robert H. Williams, research and development department, Socony-Vacuum Laboratories, Paulsboro, N. J., has been selected to receive a 1951 Incentive Fellowship Award from Socony-Vacuum Oil Co., Inc., for advanced study. A similar award was given to **James C. Melrose** of the field-research laboratories of Magnolia Petroleum Co., Dallas, an affiliate of Socony-Vacuum.

Robert E. Wilson, of Chicago, chairman of the board, Standard Oil Co. (Ind.), has been appointed chairman of the Committee on Research for the National Association of Manufacturers.

William L. Aycock, division master mechanic for Transcontinental Gas Pipe Line Corp. at Atlanta, Ga., has been transferred to Mooresville, N. C., as compressor-station superintendent.

L. L. Henning has been appointed superintendent of the chemical division at Standard Oil Co. of California's Richmond, Calif., refinery. He replaces **R. L. Humphreys,** who has been transferred to California Research Corp.

G. M. Bell, Oklahoma district petroleum engineer for The Texas Co., has been named assistant division petroleum engineer. **E. R. Filley, Jr.,** at present doing engineering work in the division office at Tulsa, will succeed Bell as Oklahoma district petroleum engineer. Formerly Bell worked in Colombia for Engineers, Ltd., on the construction of a pipe line for South American Gulf Oil Co. He then returned to the University of Oklahoma and obtained a degree in petroleum engineering. Filley joined Texaco temporarily while attending the University of Texas in 1941. After serving in the Air Force he attended the University of Tulsa, and then reentered the service of The Texas Co.

DEATHS

Max B. Miller, 64, president of Max B. Miller & Co., Inc., New York petroleum-engineering firm, died March 31 in New York. During World War II he was chief of construction for Petroleum Administration for War, and concentrated chiefly on construction of high-octane gasoline plants.

Edgar Clinton Johnston, Sr., 52, nationally known pioneer oil man, died recently at Longview, Tex. Besides heading the oil company which bears his name, he was a partner in Johnston Enterprises with plants at Greggton, Tex., and Los Angeles.

William J. Sexton, 64, retail-credit manager in the marketing division of Skelly Oil Co. at Kansas City, died March 29.

Charles Henry Bossley, 54, Stanolind Oil & Gas Co., died at Beaumont, Tex., March 24.

R. W. Jeffrey, retired oil-well-supply company executive, died in Houston on March 28. He was formerly vice president of Wilson Supply Co., which he helped organize in 1921.

James Franklin Reagan, 68, retired independent oil producer, died in Tulsa on March 26. He was formerly field superintendent and general manager of Foster Oil Co., and worked for Standard Oil Co. in Romania during World War I. He was an independent producer at the time of his retirement 15 years ago.

David C. Ball, 93, organizer and chairman of the board of directors of Oakite Products, Inc., New York City, died March 23 at Lake Placid, N. Y.

Mrs. Zelie Marie Willson, 80, principal owner of Gladys City Oil & Gas Co. and one of the developers of the Spindletop field, died March 25 at Houston.

James Roane Masterson, 58, civil engineer for Humble Oil & Refining Co., died March 29 at Houston.

XUM

"... $26,500,000 worth of U.S. Savings Bonds a year under company Payroll Savings Plan..."

CHARLES E. WILSON

"General Electric employees are buying more than $26,500,000 worth of U. S. Savings Bonds a year under company payroll savings plans. Since the inception of our savings plans in 1917, General Electric employees have saved $445,000,000 of which $280,000,000 consisted of the purchase of United States Savings Bonds since May, 1941. The record speaks for itself."

The record of General Electric Company, and the records of more than 21,000 other large companies, prove that employees *want* to save the easy, automatic way—the Payroll Savings Plan.

As of November 1, 1950, more than 8,000,000 employees were buying U. S. Savings Bonds *every month.* While the figure was impressive, it was not as large as it should have been—a fact recognized by many companies.

In November and December, top executives of literally thousands of large companies (employing one hundred or more) decided to check their Payroll Savings Plan and endeavor to increase participation to 60% or more.

Here are a few December reports: in one of the larger units of a leading steel corporation, participation went from 20% to 80.6 per cent . . . a well-known independent steel company (13,710 employees) reported 82% participation . . . another large steel company (100,000 employees), 75% participation . . . one plant of a large rubber corporation climbed to 94% (company average, all plants, 70%—and still going up). Tabulation of all companies exceeding 60% participation in December would literally fill this page.

Higher participation in the Payroll Savings Plan is good for the men and women for whom it builds security. It is good for the company because a saving employee is a better workman, a better citizen. It is good for the country because the month after month purchase of U. S. Savings Bonds by millions of Americans is a most effective check on inflationary tendencies.

Phone, write or wire, now, to Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, Washington, D.C. Your State Director has a simple, four-point promotion plan, concluding with a person to person canvass that puts a Payroll Savings Application Blank in the hands of every employee. That's all you have to do—and you'll be surprised at the response from employees who *want* to save.

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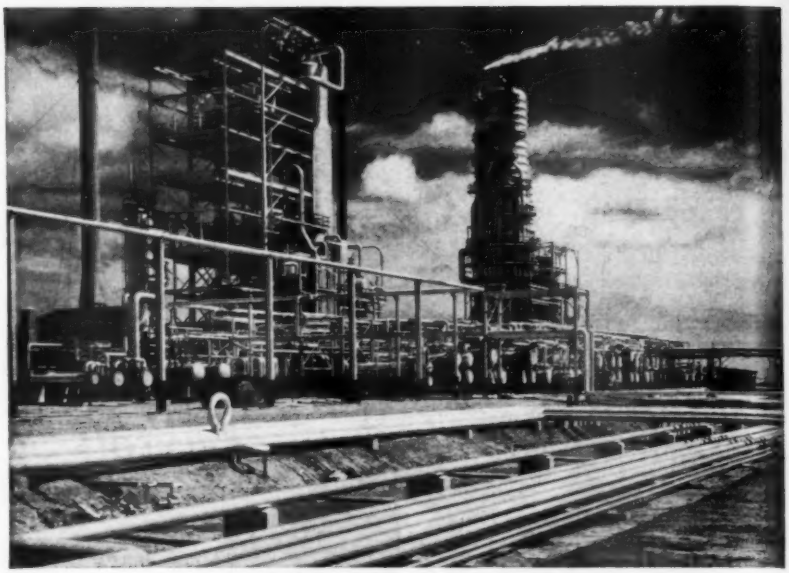


This 63,000-bbl. per day crude distillation unit at Creole's Amuay Bay refinery is one of the largest combination atmospheric and vacuum units in the world. Between the atmospheric section, left, and the vacuum section, right, are installed all exchangers and coolers, so arranged as to facilitate cleaning and maintenance.

Creole's New Atmospheric-Vacuum

SIXTY-THREE THOUSAND barrels per day is the design capacity of the new atmospheric and vacuum crude distillation unit recently placed in operation at the Amuay Bay, Venezuela, refinery of Creole Petroleum Corp. Standard Oil Development Co. furnished process design, while mechanical design, engineering and construction of the unit were provided by Foster Wheeler Corp. In addition to the crude unit, Foster Wheeler built caustic-washing facilities for naphtha and kerosine distillates, an asphalt oxidizing plant, water-treating and sewage facilities, and fabricated and machined all the piping and structural steel for both process and offsite requirements.

This modern distillation unit is the nucleus of the new Venezuelan refinery which will process the crude petroleum from Bolivar coastal field, where there are estimated to be crude reserves of over 4.5 billion barrels. A 145-mile pipe line carries the crude from the lake fields to the Amuay Bay refinery. The unit was designed to handle the 27.1° A.P.I. gravity high-cetane Tia Juana crude or 26.1° A.P.I. gravity Tia Juana 102 low-cold-test crude. Sufficient flexibility was incorporated into the unit to make possible a wide selection of quality intermediates from both the atmospheric and vacuum stages and also for the processing, at some future date, of a lighter crude of the East Texas type. Practically all of the steel structural members and major vessels were fabricated on the site and most of the labor was recruited from native villages and trained for both skilled and general occupations. Pipe threading, pipe bending, and general fabrication in the modern shop at the site greatly facilitated the construction and was significantly responsible for an early completion date.

General Description of Unit

The crude-distillation and fractionating unit is separated into two stages. In the first or atmospheric stage a gas, a light naphtha overhead, two side streams, and a reduced crude are separated from the crude under atmospheric pressure. The atmospheric fractionating column, which is 15½ ft. in diameter at the lower section, contains 26 bubble plates and is provided with two side-stream strippers.

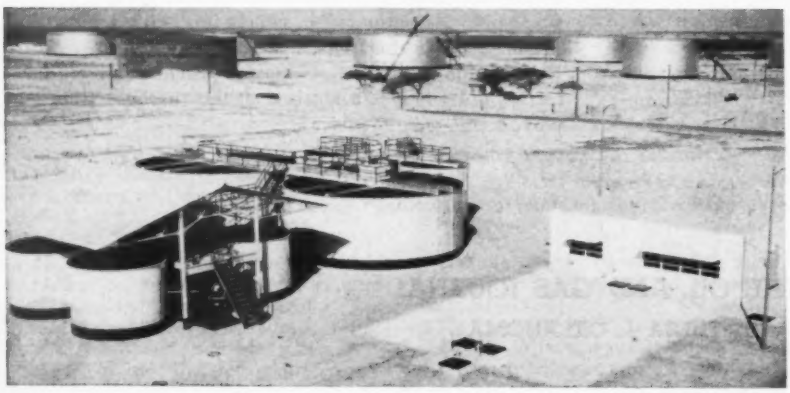
The reduced crude, representing 60 per cent of the charge, is fractionated in the second stage in a vacuum column that is 28 ft. in diameter at its center section and contains 29 bubble plates. An overhead distillate, three side streams (which are also stripped to flash specifications in side-stream strippers), and asphalt bottoms are separated from the reduced crude in this column under a vacuum of 51 mm. Hg. at the top of the column. Exhaust steam, superheated in both the atmospheric and vacuum direct-fired heaters, is used in both columns to aid the vaporization and for stripping the side streams.

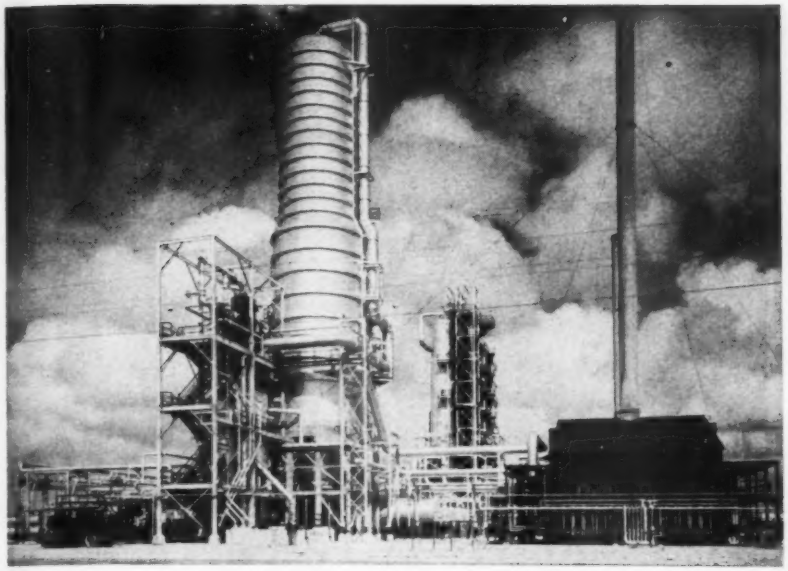
Two direct-fired tubular heaters of special design are used to supply the heat for vaporizing the crude charge and the reduced crude. The atmospheric crude heater, containing 10,737 sq. ft. of heating surface, liberates 147,000,000 B.t.u. per hour. The vacuum heater, which has 8,588 sq. ft. of heating surface, liberates 87,200,000 B.t.u. per hour—a total for both heaters of 234,200,000 B.t.u. per hour. On the basis of a heat content of 145,000 B.t.u per gallon of fuel oil, this figure represents an over-all hourly firing rate of 1,600 gal. or approximately 1.45 per cent of the crude charged.

A total of 35 heat exchangers, not including spares, are used to preheat the crude by exchange of heat with both atmospheric and vacuum overheads, side-stream pumparounds (recirculating reflux), and with the asphalt bottoms from the vacuum column. The total heating surface of these exchangers is 65,700 sq. ft., or 1.04 sq. ft. per barrel per day of charging crude.

The crude is preheated to approxi-

Plant water-oil separator. Process and boiler feedwater moves to the refinery through an 81-mile pipe line originating on the Venezuelan mainland.





The vacuum unit shown in the foreground operates under a vacuum of 51-mm. Hg at the top of the column and splits reduced crude into three side streams and a vacuum bottom stream.

Unit Is One of World's Largest

Nucleus of Amuay Bay refinery now in operation has a design capacity of 63,000 bbl. per day

mately 500° F. Total condensing and cooling surface comprising 22 units is 35,430 sq. ft. or 0.56 sq. ft. per barrel per day of crude charged. The total pumping capacity of all pumps other than the primary crude charging pump is 517,000 bbl. per day or 8.2 times the design charging capacity of the unit.

Automatic - flow, liquid - level, and temperature and pressure-control instruments are used functionally throughout the unit to achieve almost automatic operation.

Protection against corrosion is provided by alloy coatings in critical corrosion areas; up to ¼ in. has been allowed for corrosion on unclad areas in vessels and drums. Magnesium anodes are used to absorb the electrolitic corrosive action of the salt water used as the cooling medium in the condensers and coolers.

Simplified Flow Diagram and Process Flow Description

In the simplified flow diagram, the crude charge identified in the heavy black bar at the left of the diagram is pumped through the following sequence of exchangers before it enters the flash drums:

1. The cooler section of the atmospheric pumparound reflux.
2. Atmospheric overhead.
3. Vacuum overhead.
4. The hotter section of the atmospheric pumparound reflux system.
5. Gas-oil side stream from atmospheric column.
6. Atmospheric pump-back reflux.

The crude, preheated at this point to about 325° F., then enters the two flash drums where gas, water, and a very light naphtha are flashed off. This overhead mixture passes to the radiant section in the atmospheric heater where it assists in vaporization. The flashed crude is then pumped from the flash drums to the next series of heat exchangers in sequence as follows:

7. Second vacuum side stream.
8. Vacuum top pumparound reflux.
9. Main vacuum pumparound reflux.
10. Third vacuum side stream.
11. Vacuum bottoms.

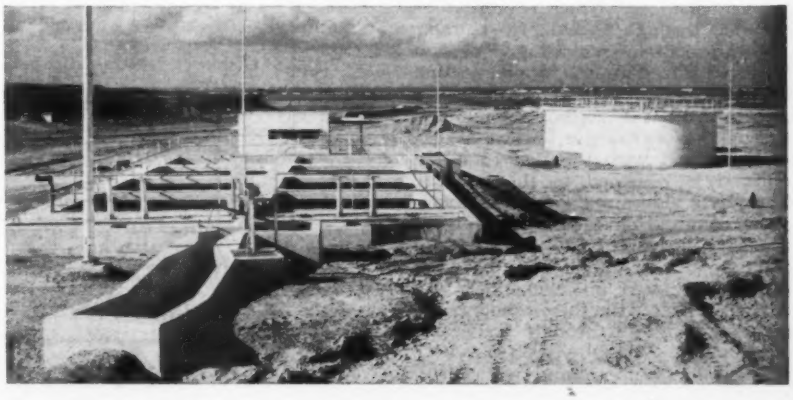
The preheated crude, now at about 500° F., enters the atmospheric direct-fired heater where the main heating and vaporizing takes place. The liquid-vapor mixture leaves the heater at 650° F. and passes to the atmospheric column. The light naphtha overhead from this column exchanges heat with the crude oil, is condensed, cooled, and is separated in the collecting drum into gas, light naphtha, and water. The gas passes into the gas-collecting system, the water is drawn off, and the light naphtha flows to storage. A reflux pump draws enough naphtha from this drum to provide the necessary reflux for tower fractionating control.

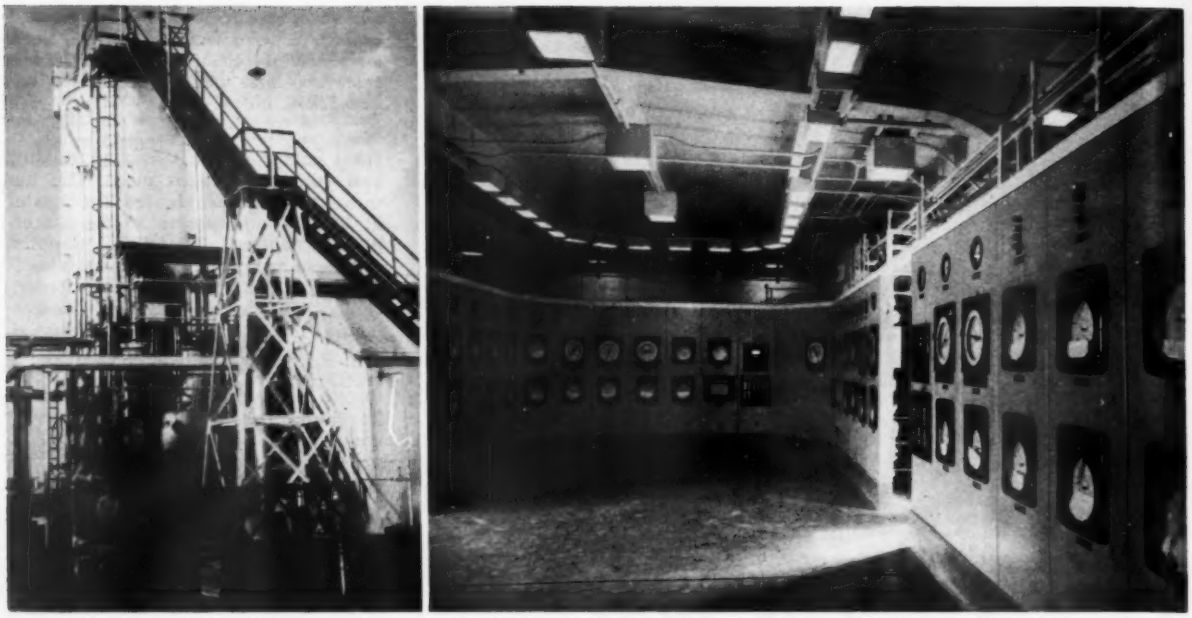
The first side stream, either a heavy naphtha or kerosine, flows from the upper section of the column into a side-stream stripper and is then pumped through a cooler to storage.

The main pumparound recirculating reflux of the atmospheric column is drawn from the sixteenth plate of the column and is pumped through heat exchangers where it gives off part of its heat to the crude oil. A cooler is provided for controlling the temperature of this circulating reflux before it reenters the column. The second side stream, which may be either a diesel oil or gas oil depending upon the quality of the crude charged, is taken from the column at the tenth plate, flows into a side-stream stripper, and is then pumped through an exchanger where it gives off part of its heat to the crude oil, then to a cooler and on to storage. A reflux pump-back system is also provided in which a pump draws from a pan in the second side-stream stripper, moving the material through a heat exchanger in the crude heat-exchanger system and returning the reflux to the column.

The reduced crude is pumped from the bottom of the atmospheric column directly into the vacuum direct-fired heater, where it is raised in temperature to approximately 750° F.,

Sewage disposal unit.





Left: Vacuum bottoms are oxidized to asphalt in this unit, the only one of its kind in Venezuela. Right: A central control room serves all units of the 63,000-bbl. per day distillation plant.

the resulting mixture of vapor and liquid then entering the vacuum column. Complete condensation takes place in the vacuum column with the exception of the steam and any noncondensable vapors—that is, the overhead from the column is drawn off in liquid state. This is accomplished by returning enough cooled liquid overhead to the top plate of the column to maintain a temperature that insures complete condensation of the lowest boiling fraction of the reduced crude charged.

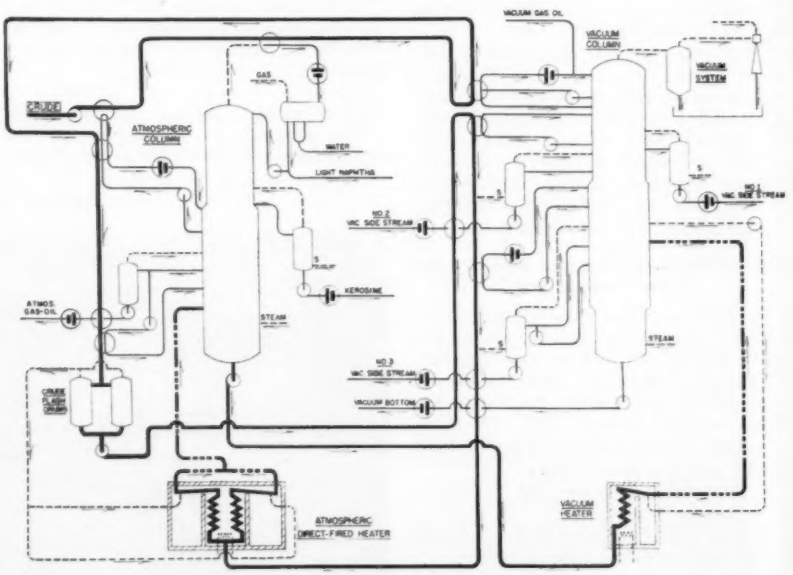
The top-of-column-product is pumped from the twenty-sixth plate to an exchanger, where it exchanges heat with the crude oil. The stream leaving the exchanger is split into two parts, one part returning to the column and the other passing through a cooler before returning to the column. The vacuum-overhead-product portion of this reflux leaves the system at a point just after the cooler.

The No. 1 side stream from the vacuum column is drawn from the upper section of the column into a side-stream stripper, from which it is pumped through a cooler to storage. An intermediate pumparound system is also utilized in the upper section of the vacuum column in which a stream from the column is pumped through an exchanger, where it exchanges heat with the flashed crude oil and is returned to the column. The No. 2 side stream from the vacuum column leaves the column at the seventeenth plate, passes into a side-stream stripper, and is then pumped through an exchanger, exchanging heat with the flashed crude oil and passing through cooler to storage.

The main pumparound reflux circulating system of the vacuum column begins at the fourteenth plate from which a stream is drawn and pumped through a flashed crude-oil heat exchanger, then through a cooler for temperature control and thence returned to the column at the sixteenth plate. The No. 3 side-stream is drawn from the column at the eleventh plate through a side-stream stripper and is then pumped through a flashed crude heat exchanger, through a cooler to storage.

Another circulating stream is pumped from the pan to the top of the No. 3 side-stream stripper back to the column for the main purpose of providing adequate liquid level on the fractionating plates just above the flash zone of the column. Further heat exchange is provided by the vacuum column bottoms which are pumped from the bottom of the column through a flashed crude heat exchanger through a cooler to storage.

The two-stage crude distillation unit representing one of the primary process units in the new refinery of Anglo-American Oil Co., Ltd., at Fawley, England, now being built by Foster Wheeler, is essentially a duplicate of the Creole unit.



Schematic flow sheet.

CARBON BLACK

–its relationship to the natural-gasoline industry

by Gordon Kiddoo*

THE carbon-black and the natural-gasoline industries are related in many ways, technically as well as economically.

Carbon black consists of extremely fine particles, ranging in diameter from 10 to 150 mμ., consisting of almost pure carbon and lesser amounts of oxygen, nitrogen, and hydrogen. It is essential to the rubber and printing industries and is used in many other industries such as paints and plastics.

Approximately 95 per cent of all carbon black manufactured is used to improve the wearing qualities of rubber. Before the widespread utilization of carbon black, the average mileage obtainable from an automobile tire was only several thousand miles, while, today, mileages of 30,000 to 40,000 and more are not uncommon. This increase in mileage is, to a large extent, the effect of the reinforcement imparted by carbon black.

The close relationship between carbon-black consumption and rubber consumption is shown by Fig. 1. In printing inks, paints, plastics, and many other applications, the uses of carbon blacks depend upon their jetness or intensity of color and upon their tinting strength or covering power.

Carbon Black Processes

Carbon blacks are made by cracking hydrocarbons—either natural gas, L.P.G. distillate, or residual oils—in the channel process, the furnace process, and the thermal decomposition process.

*Formerly technical director, Continental Carbon Co., Amarillo; present address National Research Corp., Cambridge 42, Mass. Paper presented at regional meeting, Natural Gasoline Association of America, Big Spring, Tex.

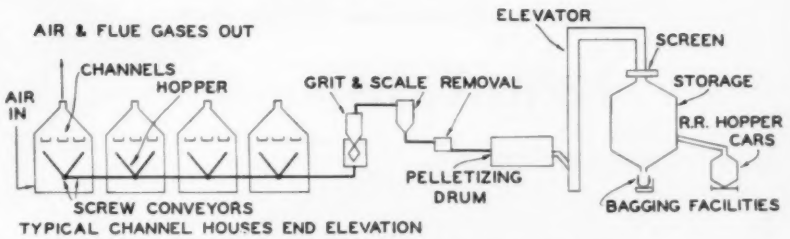


Fig. 2—Schematic flow diagram of channel process.

Channel process.—This process consists essentially of thousands of fan-shaped smoky flames produced by burning natural gas with a limited supply of air through small lava tips. These flames impinge upon moving iron channels on which the carbon black is deposited and from which it is later scraped off. A typical channel-black plant covers many acres and consists of as many as 1,200 burner houses, constructed of sheet iron. A schematic representation of the channel process is shown in Fig. 2.

All of the air for combustion is controlled by natural-draft openings in the top and bottom of the house and control of the draft is entirely visual on the part of the plant operator. Although only approximately 10 volumes of air are required to burn 1 volume of natural gas completely, the air-gas ratio may range from 25 to 100 in a channel house. This excess of air does not completely burn the natural gas because the time required for the gas to pass from the tip to the channel, only a few inches away, is very short and because there is poor mixing of the air and gas at the tip in this short interval. Nevertheless, this large excess of air does hold the hot-house temperature below 1,000° F.

Rubber-grade black yield from the channel process is ordinarily 1.50 to 2.25 lb. per M.c.f. of natural gas. Based on total carbon content of ordinary natural gas, approximately 35 lb. per M.c.f., this yield is only about 5 per cent. It should be realized, however, that a portion of the natural gas must be burned as fuel to heat the gas and air to reaction temperature and to supply the heat for cracking the hydrocarbons in a very short time interval; the true yield of carbon black from the channel process is about 35 per cent of the theoretically available carbon.

For any given channel-black plant, operating on gas of known and constant quality, as the gas rate (commonly called the "tip rate" in the carbon-black industry and expressed as cubic feet per day per tip) is increased, the yield of carbon black

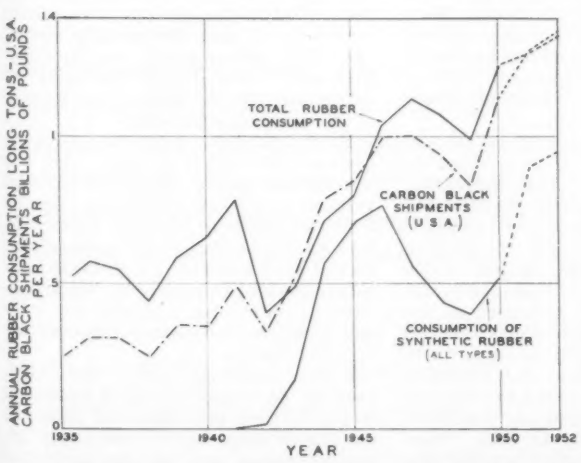


Fig. 1—United States rubber consumption and carbon-black shipments.

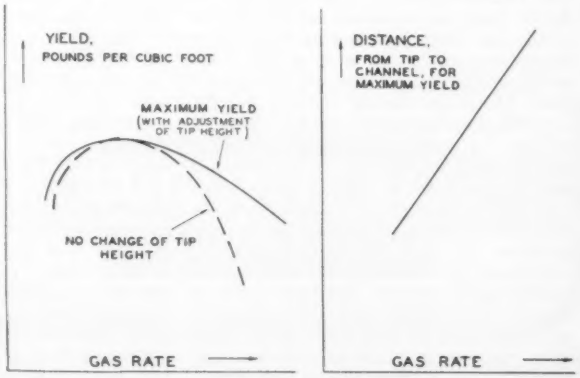

YIELD, POUNDS PER CUBIC FOOT
MAXIMUM YIELD (WITH ADJUSTMENT OF TIP HEIGHT)
NO CHANGE OF TIP HEIGHT
GAS RATE
DISTANCE, FROM TIP TO CHANNEL, FOR MAXIMUM YIELD
GAS RATE

Fig. 3—Channel-plant operation.

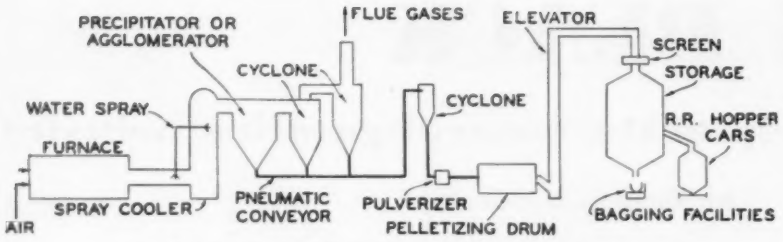


Fig. 4—Schematic flow diagram of furnace process.

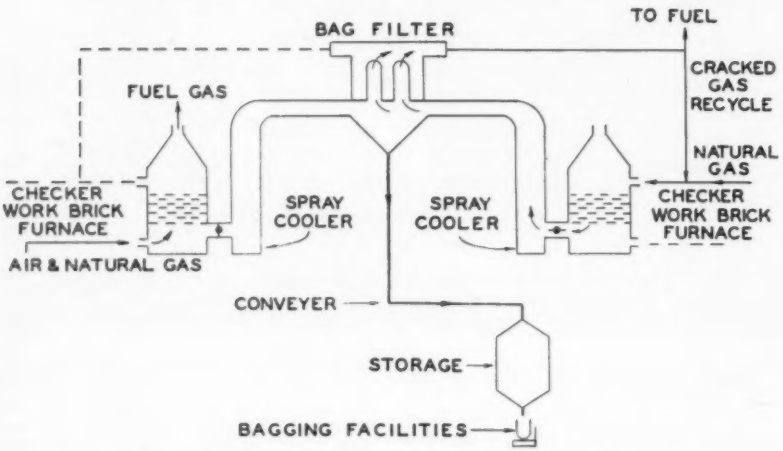


Fig. 5—Schematic flow diagram of thermal decomposition process.

rises to a point where, with further increase in gas rate, the yield drops off. This is shown by the dotted line in Fig. 3. If it is assumed that the maximum point on this curve represents the optimum tip height (the distance from the tip to the channel) then by adjusting the tip height for gas rates other than that corresponding to this maximum, yields greater than that shown by the dotted line can be obtained. However, the yields will be somewhat less than the maximum. This is shown by the solid-line curve. Thus, it is seen that as the gas rate is increased, it is necessary to increase the tip height or distance to achieve the maximum possible yield. However, operation at the point of maximum yield is not always possible.

Sometimes gas commitments require the consumption of gas volumes so large that gas rates in excess of the optimum must be used and at other times, gas rates lower than the optimum must be used because of lack of gas. Although ideally the tip height should be adjusted each time a change in gas rate is made so as to obtain the maximum yield possible at each gas rate, in practice this is not feasible. Lowering or raising the tip heights in channel houses is an expensive and time-consuming job, requiring the shutdown of each house while this change is made. As a result, in practice the tip height is set ordinarily at that point which will give maximum yield at average gas rate. For gas rates above or below this average no change in tip height is made. Changes in tip heights of less than ¼ in. are not ordinarily made.

Channel-plant operations are not always carried on at the point of maximum yield for another reason, that of quality. The point of maximum yield and optimum quality do not always coincide. To maintain quality it is occasionally necessary to operate channel plants at gas rates and/or tip heights other than those which give maximum yields.

Both in the carbon-black and the natural-gasoline industry it is well known that the richer a natural gas or the higher its heating content, the greater is the yield of carbon black from that gas. However, this statement is only part of the truth. More important than the heating content is the carbon content of the gas, often expressed as mols of carbon per mol of gas, or pounds of carbon per thousand cubic feet of gas.

The B.t.u. value, or heating content of the gas is not a true measure of its carbon-black forming potentialities. As one progresses through the paraffinic hydrocarbons, for example from methane to ethane to propane and so on, the carbon content of the gas increases faster than does the heating content. In addition to the greater weight of carbon contained in a cubic foot of hexane, as opposed to a cubic foot of ethane, for example, the heat required to crack the heavier hydrocarbon, expressed per pound or per mol of carbon, is less. Thus, although it is generally true that the gas with the higher heating content will give a greater yield of channel black than will a gas with a lower heating value, nevertheless, the true measure of the carbon black which can be obtained from any given gas depends more exactly upon the chemical composition of the gas.

Furnace process.—The second principal process for the manufacture of carbon black is the combustion furnace process. This process is similar to the channel process in that it involves the incomplete combustion of natural gas or other hydrocarbons. It differs, however, in that while the channel process depends upon many small flames, each essentially a complete unit, in a furnace plant the flames are fewer in number but larger in size and are contained in a refractory combustion chamber.

As shown in Fig. 4, a furnace plant consists of one or more furnaces or combustion chambers, a duct leading to a spray cooler, a spray cooler, an electrical precipitator, several cyclones for separating the black from the combustion gases, and conveying, bagging, and storage facilities.

Into the combustion chamber are continually introduced the source of carbon—natural gas or oil—and from four to eight volumes of air per volume of equivalent methane. Insufficient air is introduced for complete combustion of the fuel but sufficient combustion does take place to maintain a furnace temperature of 2,000 to 3,000° F., sufficiently high to crack part of the unburned hydrocarbon to carbon black, and gaseous products. The furnace temperature is determined by the air-gas ratio, the flow rate, the turbulency of the combustion, and the extent of combustion permitted.

The hot products of combustion and cracking pass from the furnace through a refractory-lined duct and are quenched by direct-water spray to 500° to 600° F., somewhat above the dew point of the gas. From the top of the vertical spray cooler, the flue gases and black pass through an electrostatic precipitator in which the very fine carbon-black particles suspended in the gas stream are subjected to a high-electrostatic potential. The carbon-black particles agglomerate into larger particles of sufficient size for subsequent removal in two-stage cyclones.

From the top of the second-stage cyclone the hot flue gases and the uncollected carbon black are allowed to pass to the atmosphere while the collected black is removed from hoppers at the bottom of the precipitator and of each cyclone. From these hoppers the black passes through conveying, pelletizing, bagging, and storage facilities similar to those used for channel blacks.

Many variables affect the type, quality, and yield of black produced in the furnace processes and many of the design features of a furnace plant are empirical and can be evaluated only by trial and error.

Thermal process.—The manufac-

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ture of carbon black by the thermal decomposition of natural gas is termed the thermal process.

When natural gas is brought into contact with hot refractory surfaces and held at an elevated temperature for sufficient time, it decomposes into carbon, hydrogen, and cracked gases. Apparatus necessary for this process consists essentially of a number of furnaces, or converters, filled with checker-fire-bricks, and equipment for cooling and collecting black (Fig. 5). The operation is cyclic, a heating period and "make" period being required.

In the heating period the combustion of natural gas or other combustibles with air heats the furnace to 3,000° F. When the refractory has reached this desired temperature, the combustion is stopped and natural gas is fed into the furnace and is thermally decomposed to carbon, hydrogen, and cracked gases. The cracked products pass from the furnace and are cooled by water spray; the carbon black is separated in bag filters or by water washing and is subsequently filtered, dried, pulverized, screened, and bagged.

After the refractory has cooled during the "make" cycle, the flow of natural gas to the furnace is stopped and the heating cycle is started again. The heating and make periods are of such lengths that the desired black is produced, and in practice the timing of the cycles is staggered so that some of the furnaces are always producing black while others are being heated.

Classification of Carbon Blacks

The method of making the carbon black determines to a great extent where and how they may be used. These features determine, in part, the classification of the various blacks.

Channel black. — Rubber-grade channel blacks are classified principally upon the basis of their ease of processing into rubber or their electrical conductivity. These classifications represent principally the change in utility with change in particle size although other physical and chemical properties also effect the classifications.

In general it can be said that channel blacks find their greatest utility when compounded with natural rubber. They are of special value in heavy-duty truck and bus tires where high heat buildup is encountered because natural rubber compounded with channel blacks is generally preferred for low heat buildup compatible with satisfactory abrasion resistance.

Color-grade blacks used for inks and paints are produced almost exclusively by the channel process or by other impingement processes.

The production of channel blacks increased substantially during the latter part of World War II and immediately thereafter, although not at the rate at which furnace-black production increased, but now appears to be leveling off. Because the steel requirements and capital investment are high, economic channel-plant operations depend upon a long-term source of natural gas. With increasing volumes of natural gas being diverted to the pipe lines, much of the natural gas available for carbon-black manufacture is being, and will probably continue to be, diverted to furnace plants which give higher yields of black and which require smaller capital investments.

Probably of greater importance, however, is the fact that channel blacks are facing competition from the newer furnace blacks made from oil. For many uses for which channel blacks have been used in the past, oil blacks are superior and are preferred, even at a slightly higher price.

Furnace blacks.—These are classified according to reinforcement of rubber, electrical conductance, or particle fineness.

Prior to World War II the production of furnace blacks was very small compared to that of channel blacks, amounting in 1940 to only 13.5 per cent of the total carbon-black production. Since that time, however, furnace blacks have increased greatly in importance and currently account for approximately 58 per cent of all carbon-black production.

Until the end of World War II almost all of the furnace blacks were manufactured from natural gas or other naturally gaseous hydrocarbons. Since about 1945, however, the so-called "oil blacks," manufactured from oil rather than from gaseous hydrocarbons, have grown steadily in importance. Oil blacks now account for 49 per cent of all furnace-black production and for 27 per cent of all carbon-black production, and in 1951, based on plans for new facilities already announced, will represent over 40 per cent of all carbon-black production.

The importance of all furnace blacks has increased greatly in the last 10 years largely because of the greatly increased use of synthetic

(Continued on page 94)

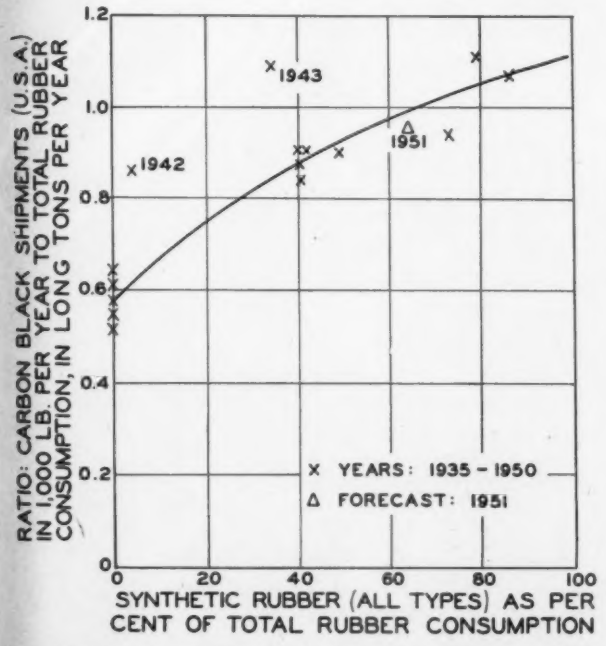

Fig. 6—Effect of synthetic-rubber consumption upon carbon-black consumption.

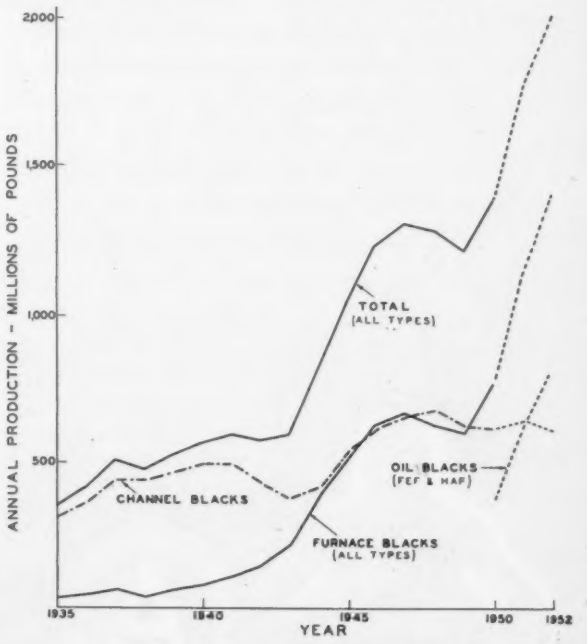

Fig. 7—Carbon-black production, 1935-1952.

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High-Speed

ELECTRONIC RESERVOIR ANALYZER

by O. L. Patterson,* K. E. Montague,† and Byron Wiess, Jr.†

A high-speed electronic reservoir analyzer of improved accuracy for predicting the unsteady-state behavior of oil reservoirs is described. The analyzer repeats the entire history of reservoir perfomance cyclically at a rate of 250 times each second. The high repetition rate permits immediate observation and measurement of the effects of adjustments in reservoir parameters or production programs on reservoir performance. The basic electric analogy for a water-drive reservoir has been extended to include an analog representing a gas cap.

THE fundamental problem of the reservoir engineer is to determine the available producing energies due to solution gas, free gas, and compressed liquids in the oil zone in addition to that due to the expansion and inflow of water from without the oil zone.

Hydrocarbon production is usually accomplished by a combination of the basic recovery mechanisms. Depending upon the particular reservoir configuration and the distribution of the energies of fluid compression, there exists an optimum combination of natural or artificial recovery mechanisms which will result in the most efficient exploitation. In order to determine the best combination of these basic mechanisms it is conventional to determine mathematically the natural energy relationships.

The complete mathematical approach to reservoir energy analysis has the disadvantage that basic knowledge of some significant reservoir parameters is usually lacking. This, together with the extreme complexity of mathematical calculations, makes the application impractically tedious in handling routine problems. Due to these severe limitations there has been a concerted effort to simplify and possibly supplant the mathematical solution. Most of these efforts have centered around the development of analyzers based upon the analogy between the flow of fluids through porous media and the flow of electric current through conductive media.

Bruce[1] demonstrated the practicability of employing an electrical analogy to the unsteady-state solution of water-drive reservoir problems. The advantage of the analog lies in the possibility of immediate perception of the result of any change in parameters, and so to converge by a cut-and-try process to a close representation of a relatively complex problem.

The present development was directed toward the problem of securing maximum instrumental precision together with a high speed of response. This was attained by making use of a principle in analog operation which involves the repetition of the entire reservoir performance history many times per second. The method includes electronic techniques which were developed to take advantage of the fast repetitive operation in achieving high precision of measurement and control.

Water-drive fields with gas caps are directly represented by incorporation of an analog circuit for the gas cap. With this extension the analyzer is capable of making rapid and accurate predictions of future behavior of a wide variety of reservoirs on the basis of their past performance.

*Sun Physical Laboratory, Newtown Square, Pa. †Sun Oil Co., Beaumont, Tex. Portion of paper given at A.P.I. Division of Production meeting, Beaumont, Tex., March 7-9, 1951.

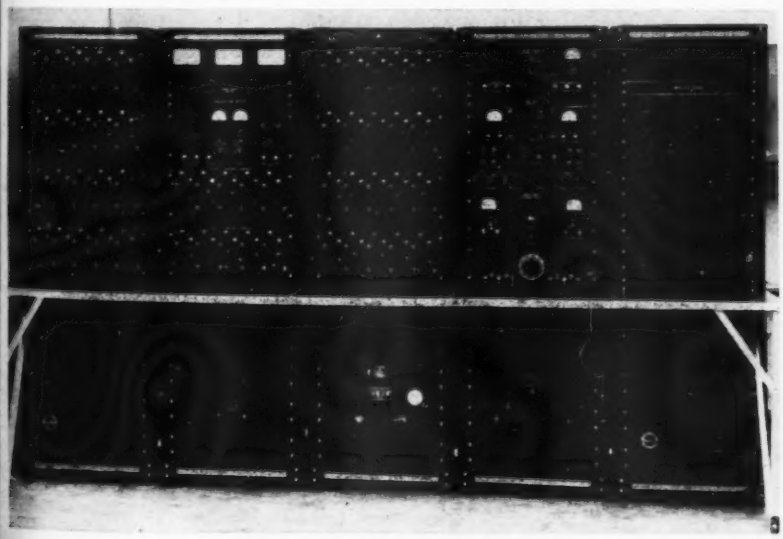

Fig. 1—High-speed reservoir analyzer.

General Principles of High-Speed Analyzer

1. **Objectives of present design.**—The primary objectives in the design of the high-speed analyzer were directed toward the development of equipment which would support the reservoir engineer in his routine reservoir analyses. The successful realization of such an objective required a flexible high-speed system which was generally applicable to the majority of oil reservoirs regardless of the predominant producing mechanism. More specifically, the attainment of this goal required the analyzer to possess the following characteristics:

(a) Very high speed of operation so

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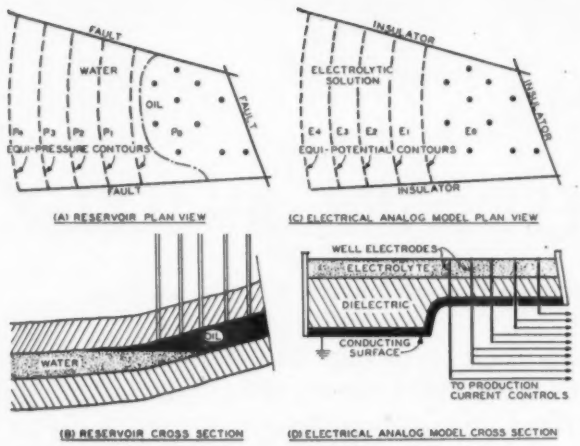

Fig. 2—Direct electrical analog of oil field.

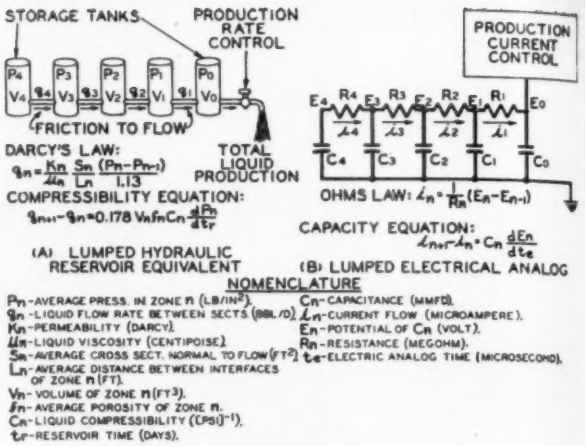

Fig. 3—Lumped hydraulic-electric analogs.

that changes in the representation of reservoir properties and production rates would provide immediately observable and measurable effects on the indicated reservoir performance.

(b) Fidelity and completeness of representation of oil reservoirs and adjoining zones.

(c) Inclusion of a gas behavior analog so that partial water-drive fields with gas caps could be readily handled.

(d) Precision of measurement and flexibility of control.

2. **Principles of cyclic repetition.**—The achievement of high-speed operation is dependent on the use of small resistances or capacitances, or both. If the electric analog is allowed to execute only a single cycle for each problem, the speed is severely limited by the speed of response of available metering and recording equipment. However, by repeating the reservoir history cyclically in the analyzer, it is possible to make recording equipment capable of measuring the resultant voltage waveforms. When this method is used the ultimate speed becomes limited only by stray wiring capacitances and inductances. The compromise selected was the choice of a time scale of 4,000 microseconds with a corresponding repetition rate of 250 times per second.

When the repetition principle is employed the entire history of production and pressure decline can be displayed on an oscilloscope which permits continuous visual observation of the reservoir performance. Since oscilloscopes are not sufficiently accurate for quantitative measurements, it was necessary to develop circuits for measuring accurately the value of a rapidly changing voltage at any selected instant of time.

The achievement of improved accuracy in representation of water-drive reservoirs is largely an electronic component problem. The very short time scale permits the use of good-quality mica capacitors which have negligible leakage as compared with the large electrolytic capacitors required in long time scale systems. In the repetitive system the instability of vacuum tubes, occurring during a period of 4,000 microseconds, is negligible. Another advantage of the cyclic repetition at a relatively high frequency is that measurements represent an average of a large number of cycles. Consequently, the effects of power line surges or other random variations are minimized.

3. **Gas - cap analog.**—Extension of the electric analogy to include gas caps requires an electrical configuration that obeys the gas laws. Since no direct electric analog was known, an electronic circuit was devised which produces a current flow with change in pressure as called for by the gas law. As such, this is analogous to the gas-cap behavior in its effects on the water-drive representation.

The functional principles of the analyzer may be understood best by referring to the block diagram of Fig. 4. The water drive network consists of 10 adjustable resistor-capacitor sections, each provided with circuits for charging the entire network to a potential corresponding to the original reservoir pressure at the beginning of each history cycle. Connected to the capacitor representing the reservoir (reservoir capacitor) are the liquid production control unit and the gas cap analog which control the withdrawal or injection of electrical charge in accordance with the reservoir production schedule and appropriate gas-cap behavior. The decline in the potential of the reservoir capacitor is representative of the pressure behavior in the reservoir.

Timing and synchronizing controls for the analyzer are provided by the timer

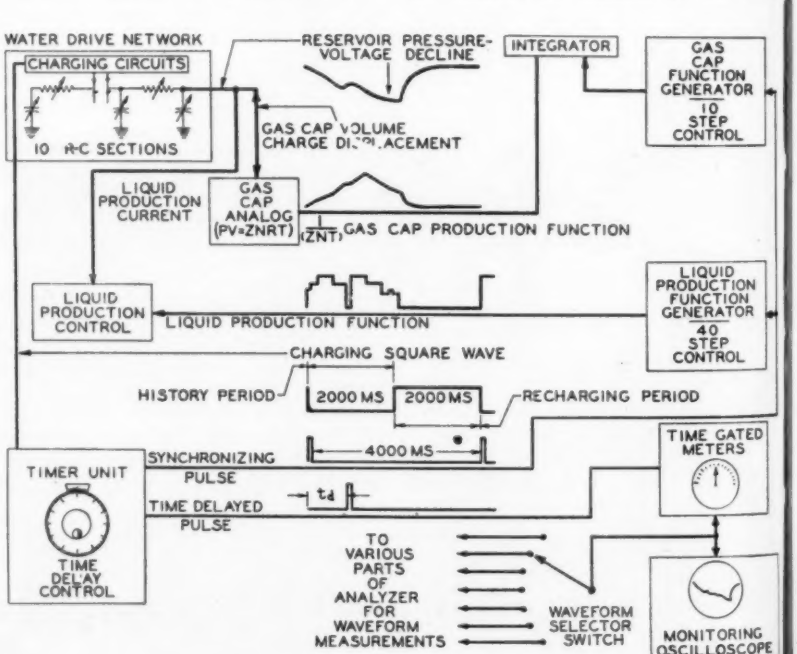

Fig. 4—High-speed reservoir analyzer system block diagram.

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unit which also generates the repetition frequency of 250 cycles per second. The period of each cycle is 4,000 microseconds, of which the first half is used for the reservoir history and the last half for recharging and recovery of all circuits to initial conditions for the start of the ensuing cycle. A square wave is supplied to the water-drive network for this purpose.

A synchronizing pulse ("synch") of about 1 microsecond duration is distributed throughout the system at the beginning of each cycle for the purpose of initiating various operations in the analyzer. This pulse initiates the generation of a series of voltage step functions which are used to represent the liquid production program. The amplitude and the duration of these steps, which may include as many as 40, are adjustable so that any given liquid production rate curve may be generated in the form of a voltage waveform as shown in Fig. 4. This waveform is applied to the liquid production control unit which withdraws (or injects) a proportional current from the reservoir capacitor.

The gas-cap unit consists of an electronic circuit which is analogous to the gas laws in its behavior. Its operation is therefore governed by the relationship PV = ZNRT. This may be expressed in appropriate electrical quantities by:

$$E_P q_v = (ZNRT)$$

where

E_P = average reservoir pressure voltage

q_v = electric charge representing the gas-cap volume

Z = gas deviation factor

N = number of mols of gas in the cap

R = gas constant

T = absolute temperature

As the volume of gas contracts or expands a corresponding change in the volume charge, q_v, is delivered through the connection between the gas-cap unit and the reservoir capacitor. The magnitude of q_v is automatically maintained at a value determined by the above equation regardless of variations in the other terms of the equation.

If gas is injected into or produced from the cap, the value of N must be changed accordingly. Since N is subject to arbitrary control of production or injection, it is necessary to provide a means for introducing an arbitrary variation of N with time. Z and T do not normally suffer appreciable change and are therefore combined with N so that only one functional voltage need be generated.

Because of the nature of the gas-cap unit it is convenient to generate and use the reciprocal of (ZNT) as a voltage waveform to represent gas-cap production or injection. Production and injection data, together with "PV" curves, form the basis for the relatively simple calculation of this function which is supplied to the gas-cap unit as a series of straight line segments of controllable slope and duration as shown in Fig. 4.

Measurement of the various voltage waveforms is accomplished in the following manner. The timer emits a pulse of about 1 microsecond duration which can be accurately delayed, relative to the "zero" time synch pulse, by any given time interval as set by a calibrated dial. This time delayed pulse is applied to a circuit which also receives the selected waveform under measurement. This circuit provides a d.c. voltage output which is equal to the value of the input waveform at the instant that the time delayed pulse occurs.

The output voltage is read directly from a voltmeter. This circuit has been designated as a "time gated meter." By turning the timer dial, the value of the waveform at any instant can be determined. Further details of the circuit principles are given in the appendix.

Validity of Representation

Since the analyzer includes a number of approximations in its representation of a reservoir and because the amount and accuracy of the data are limited, it is highly important to evaluate properly the effects of these factors for best interpretation of results. Fortunately, the analyzer itself can furnish evidence concerning the accuracy of results and predictions so that the limitations imposed by lack of information can be evaluated.

The main approximation which is used in the analyzer's representation of a reservoir is that involved in the withdrawal of current from a single point of the water-drive network. Such a procedure implies that the detailed performance throughout the reservoir is disregarded in favor of a practical study of the gross behavior of the reservoir and associated water drive.

In view of this, "average" reservoir pressures have a significance consistent with the approximations involved and are therefore used in analysis. The inaccuracies which are introduced by this procedure may become appreciable in highly complex reservoirs having large pressure gradients where the term average reservoir pressure lacks definite physical significance. In such cases, multiple points of withdrawal should properly be used, but the complexity of the reservoir makes this procedure unduly tedious and open to some question concerning the accuracy with which the geometry and properties of the reservoir are known.

The principal problem involved in setting up the analyzer is that of adjusting the water-drive network so that its response corresponds with that of the reservoir under study. Although the appropriate values of resistances and capacitances could be calculated from detailed data on the reservoir, the data at hand are seldom, if ever, adequate for this purpose. Since the character of the pressure behavior in the reservoir does reflect the character of the water drive, it is possible to use the pressure decline history as data for adjustment of the water-drive network.

The analog method therefore becomes a powerful tool since the structure of the water drive may, in effect, be determined by trial-and-error adjustment of the analyzer until its pressure-decline curve agrees with the measured pressure points. The validity of such a method depends upon the amount and character of the pressure-production history, the accuracy of these data, and a proper account of gas-cap and solution-gas-reservoir energies. Analogs of both gas-cap and solution-gas behavior are desirable in analyzing reservoirs where energy is supplied by these sources. Although present model does not have a solution-gas analog, methods are available to account for effects of solution gas in those cases where its energy contribution is significant.

Example of Analysis of Reservoir "A"

Reservoir "A" is a middle Frio regional sand development of uniform thickness. The oil zone occurs as a thin blanket-type column underlying a gas cap of approximately one-half of the original volume of the oil zone. Water drive is very strong with the chief production problems involving the production of free gas and water.

Analysis.—The reservoir was treated in the usual manner with the oil, water, and gas production set into the analyzer in accordance with Fig. 5, which also shows the expected performance under three production conditions for the future. The reservoir pressure history exhibited a very strong water drive. The unusual performance indicated here was gas-cap shrinkage caused by the combination of a strong water drive and the unavoidable production of free gas.

One of the problems in the analysis of this reservoir was to arrive at a quantitative figure for current and future water influx rates. Such information is desirable in order to determine the probable operating pressures which are necessary for engineering a gas-cap maintenance program.

Results.—Fig. 5 shows that the current water influx rate is adequate to maintain current withdrawal rates through the fourteenth year with a base operating pressure of 3,235 psi. Fig. 6 is a photograph of the oscilloscope presentation setting forth one condition of the data plotted in Fig 5.

The break in the pressure decline curve was accomplished by "blanking" the oscilloscope at the beginning of the prediction period to provide a visual marker at that time. It will be noted in this and the other photographs of the oscilloscope presentation that there is an undesirable compression of the time scale during the early part of the history. This is one of the disadvantages which makes the use of oscilloscopes impractical for quantitative measurements.

The results of the analysis also showed that the water drive will sustain large increases in withdrawal at operating reservoir pressures above the gas equilibrium point of approximately 2,800 psi. In view of the an-

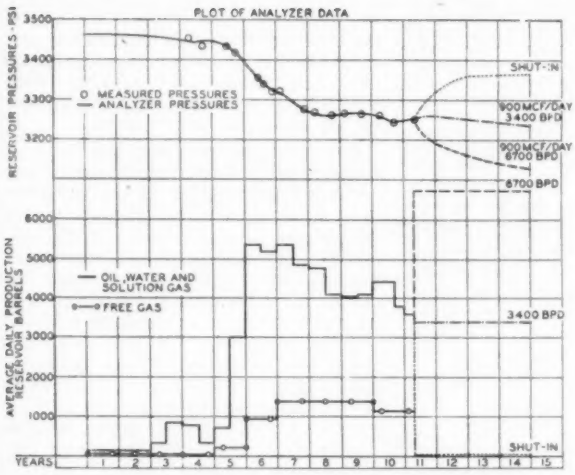

Fig. 5—Reservoir "A"—production and pressure vs. time.

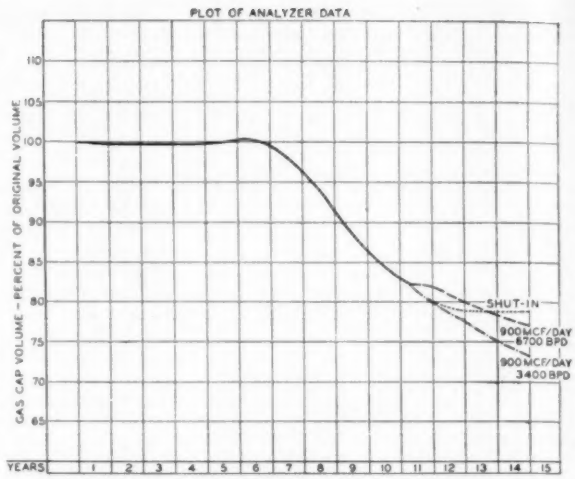

Fig. 7a—Reservoir "A"—gas-cap behavior.

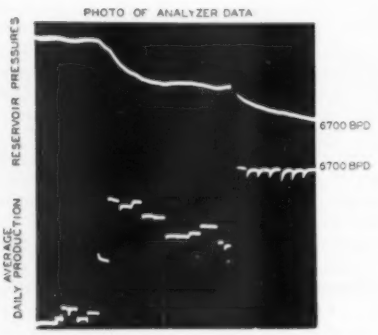

Fig. 6—Reservoir "A"—production and pressure vs. time.

ticipated large increases in water production, this information is important.

The gas-cap behavior curve shown in Fig. 7a is a clear indication of gas-cap shrinkage. Due to the analyzer's indication of an original pressure less than the measured pressure, the gas-cap behavior is somewhat more drastic than the mathematically calculated curve using a higher base pressure. However, by utilizing the same original pressures, the curve and the indicated trend would be identical with the mathematical determination.

Because of an instrumental difficulty in measuring the very small change in gas-cap volume during the early history, it was found more convenient to calculate the early portion of the curve using the indicated analyzer pressures. An oscilloscope photograph of the same data is shown in Fig. 7b.

In the case of this reservoir, the analyzer was able to determine water influx rates (data not shown in Fig. 5) and the gas-cap behavior curve. It was also able to predict future water influx rates and future gas-cap behavior in a fraction of the time necessary to obtain the results mathematically.

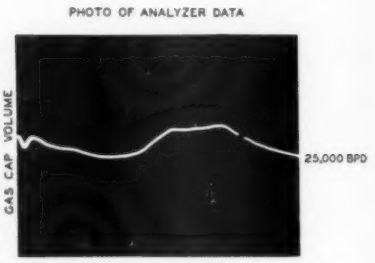

Fig. 7b—Reservoir "A"—gas-cap behavior.

Analysis of Reservoir "B"

Reservoir "B" is a Wilcox sand reservoir. The pressure history in this under-saturated oil reservoir exhibits the characteristically large pressure decline during the early producing life. The question here was the source and extent of producing energy.

Procedure.—The production history was entered into the analyzer and the pressure curve matched as shown in Fig. 8. In obtaining the pressure match it was necessary to ignore the estimated original pressure and allow the analyzer to determine that point. Despite the relatively short history of this reservoir it was found that a reasonable agreement between the analyzer and the measured pressures could be obtained only by arrangements of the water-drive network which indicated a substantial water drive.

Results.—The analyzer indicated an

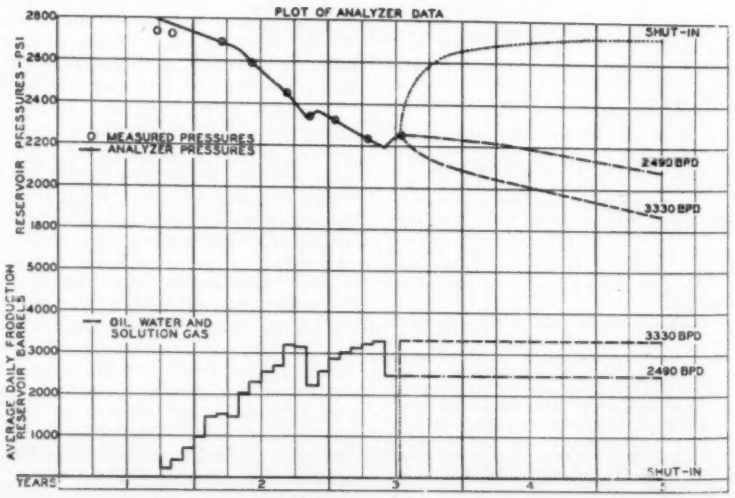

Fig. 8—Reservoir "B"—production and pressure vs. time.

initial reservoir pressure of 2,803 psi. which is higher than the early pressure measurement. It is possible that the observed pressure, which was measured in only one well, does not reflect a true average pressure. With the exception of the first two measured pressures, a very close agreement between the analyzer pressure curve and the measured pressure was obtained. In view of this, predictions could be made with reasonable confidence in their validity.

The solution of this reservoir problem indicated the analyzer's ability to solve the water-drive problem and to demonstrate the expected performance of this water drive under assumed future production rates despite the small amount of available data. This is important in a small reservoir containing under-saturated oil where it is not always possible to wait for a long and unquestioned history prior to developing plans for making corrective change in producing methods

It is apparent from this particular analysis that there is ample natural energy available to produce the oil in this reservoir at a suitable pressure level.

Analysis of Reservoir "C"

Reservoir "C" is a blanket Cockfield sand development occurring over a broad anticline. There is some faulting but generally the structure is simple and the geometric complications are limited. A large gas cap covers a major portion of the field. This reservoir was chosen as a test problem for the analyzer because of the extensive production history, the presence of a gas cap, and the absence of structural complications.

Procedure.—An extensive analysis was made of the production-pressure history for the purpose of determining the accuracy of the method. This was done in two parts:

I. A test of the ability of the analyzer to predict reservoir performance where only part of the known pressure history is utilized:

1. The data furnished the analyzer operator, in addition to gas-cap volume, included the production history complete to date and the pressure history through the tenth year only.

2. The production history prior to the end of the tenth year was set into the analyzer and a match obtained with the pressure curve observed prior to that time.

3. After a suitable fit was obtained with the history through the tenth year, the known production history from then through the middle of the eighteenth year was inserted and a pressure prediction made.

4. The predicted pressures after the tenth year were compared with the observed points and the differences are indicated in Fig. 9. The difference in the predicted value for the middle of the eighteenth year and the observed pressure at that time was only 12 lb. This, in effect, represented the pressure behavior projected 7½ years into the future.

5. The water-drive network values were then readjusted to match the data through the fifteenth year and a 2½-year prediction was made to June of the eighteenth year. The difference in this prediction and the observed value was only 6 lb.

II. A test to determine the probable accuracy of predicted values:

1. The analyzer's pressure curve was fitted to all the observed points through June of the eighteenth year and predictions were made through the twentieth year as shown in Fig. 10. Fig. 11 shows a photograph of this data as presented on an oscilloscope.

2. As wide variations as possible were made in the water-drive network without causing the pressure fit to deviate beyond the estimated tolerance of pressure meas-

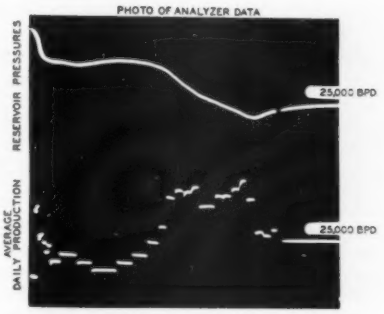

Fig. 11—Reservoir "C"—production and pressure vs. time.

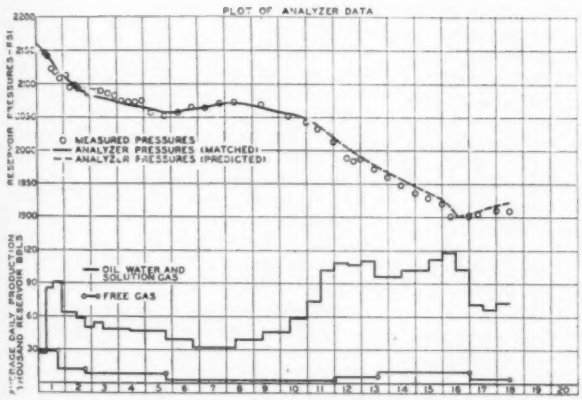

Fig. 9—Reservoir "C"—production and pressure vs. time in years.

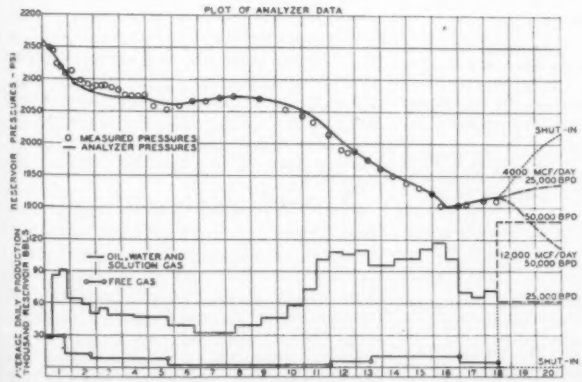

Fig. 10—Reservoir "C"—production and pressure vs. time in years.

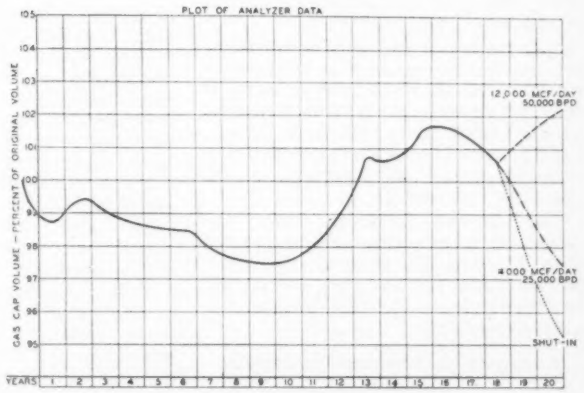

Fig. 12a—Reservoir "C"—gas-cap behavior.

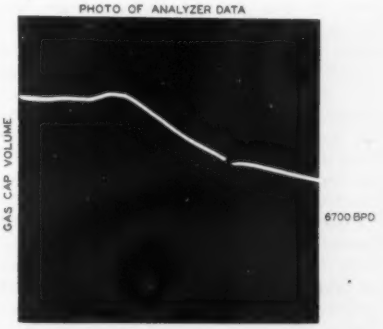

Fig. 12b—Reservoir "C"—gas-cap behavior.

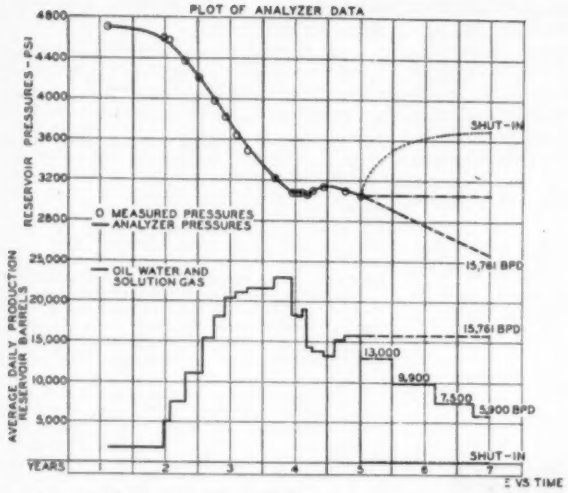

Fig. 13—Reservoir "D"—production and pressure vs. time.

urements. This was done to simulate variations in the parameters of the field. The resultant spread in predicted results showed the possible limits of accuracy for this case. The maximum variation in predicted pressures was found to be 13 lb. over a 6-year prediction period.

Results.—The results of the first test on this reservoir demonstrated the accuracy of predictions made over a period of 7½ years. This is of interest, particularly when it is recognized that the later production was at the unusually high wartime rates. The cumulative production through December of the tenth year was 179 million reservoir barrels, compared with 263 million reservoir barrels thereafter.

The results of the second test demonstrated that with the well-established pressure-production history it was not possible to vary the constants of the water-drive network significantly without deviating beyond the probable limits of accuracy of the measured pressures.

The gas-cap behavior curve obtained in this analysis is shown in Figs. 12a and 12b. It should be noted in comparing the two figures that the vertical scale of Fig. 12a is considerably expanded.

Adequacy of Pressure-Production Data

One cardinal point was evident throughout the testing period. The results can be no better than the accuracy of the production and pressure data. In fields where there are wide variations in pressures, such as are generally found in low permeability limestone reservoirs, the use of average reservoir pressures may be considered a limitation. However, in the limited experience with the analyzer, surprising success has been obtained in studying reservoirs where pressures are widely varied. Fig. 13 sets forth the results of an analysis of such a reservoir and shows that excellent agreement between the analyzer and the measured pressures was obtained.

In addition to the accuracy of pressure - production data, the amount of detail which is exhibited by the pressure decline history is an important factor in determining the accuracy of predictions made with the analyzer. In general, a complex pressure history will force a more unique set of adjustments of the water - drive network and thereby provide predictions with less error.

The sensitivity of the performance to variations of the water - drive network and to the other reservoir conditions which are set into the analyzer can be observed experimentally. Thus, the effects of uncertainties in any piece of information can be determined. Obviously, as more history is obtained the permissible variations in the analyzer settings will decrease and the accuracy of predicted behavior will increase. In other words, a large amount of reservoir history will permit predictions for a longer period within given limits of accuracy.

In some reservoirs, where the permeability is low and the water drive extends over a large area, the amount of history required may be considerable because of the time required for the effects of discontinuities and boundaries of the water zone to be exhibited by the pressure decline in the reservoir. In such cases, if a sufficient time has not elapsed since the initial production, the decline curve does not delineate the effects of the entire physical properties of the reservoir and adjacent water-bearing strata. Fortunately, when such a situation exists, the fact will be made known since considerable variations of the outer sections of the water-drive network will have but little effect on the decline curve during the known history.

References

1. W. A. Bruce, "An Electrical Device for Analyzing Oil-Reservoir Behavior," Trans. A.I.M.E. 151, 112 (1943).

2. W. Hurst, "The Unsteady State Flow of Liquids in Old Reservoirs," Physics 5, 20 (1934).

3. W. Hurst, "Water Influx Into a Reservoir and Its Application to the Equation of Volumetric Balance," Trans. A.I.M.E. 151, 57 (1943).

4. M. Muskat, "The Flow of Compressible Fluids Through Porous Media and Some Problems in Heat Conduction," Physics 5 (Mar 1934).

5. M. Muskat, "The Flow of Homogeneous Fluids in Porous Media," McGraw-Hill, New York (1937).

6. V. Paschkis and H. D. Baker, "A Method for Determining Unsteady State Heat Transfer by Means of an Electrical Analogy," Trans. A.S.M.E. (1942).

Carbon Black

(Continued from page 85)

rubber during and since World War II. The synthetic rubber industry has stimulated the consumption of furnace blacks for two reasons:

1. It was found that with the same loadings of carbon black in rubber furnace blacks were more satisfactory for many purposes in synthetic rubber than were channel blacks.

2. It was found that much higher loadings of furnace black in synthetic rubber could be used than had formerly been possible when channel blacks were compounded with natural rubber. The rubber industry has also learned to utilize furnace blacks to a considerable extent in natural rubber as well as in the synthetic product.

Thermal black. — Blacks produced by this process have relatively large particle sizes and do not reinforce rubber greatly. Relatively low priced, these blacks are easily processed into rubber and are used where high loading of carbon black are desired, particularly in synthetic rubber.

Less than 5 per cent of all carbon black is manufactured by the thermal decomposition of natural gas.

Outlook for Carbon Blacks

In Fig. 6, the annual carbon-black consumption per ton of rubber consumed is plotted against the synthetic rubber consumption, expressed as per cent of total rubber consumption. This curve shows clearly that the consumption of carbon black per long ton of rubber increases as the percentage of synthetic rubber is increased. The points representing the years 1942 and 1943 are well above the curve, because in these war years relatively small amounts of rubber, both natural and synthetic, were available for consumption and heavier-than-normal loadings of carbon black were used in an effort to extend the available rubber supplies.

With the complete reactivation of the synthetic rubber industry in the United States scheduled for completion this year, consumption of carbon blacks, particularly of oil and gas-furnace blacks, will be considerably increased within the near future. Consumption of furnace blacks will probably continue permanently at a high level, relative to channel black. This is because in addition to using gas-furnace blacks in natural rubber the rubber industry requires considerable quantities of furnace blacks, particularly oil blacks, for synthetic-rubber compounds.

Fig. 7 represents graphically the production data on carbon blacks for the past 15 years and estimated production for 1951 and 1952. Estimated production data show clearly that production of furnace blacks, particularly oil blacks, will assume an increasing importance relative to channel blacks for both technical and economic reasons.

A REPORT ON:

OIL-EMULSION DRILLING FLUIDS

by H. W. Perkins

Here is a summary of the information and data presently available to the subcommittee assigned to investigate oil-emulsion drilling fluids by the A.P.I. Southwestern District Study Committee on Drilling Fluids. A distinction is made among the various emulsifying agents, drilling fluids, and oils used in preparing oil-emulsion muds. The advantages of and objections to the use of oil-emulsion muds in the drilling operation, on the geological interpretation, and upon the completion operation are discussed.

The purpose of this report is:

1. To emphasize certain points of distinction between drilling fluids containing oil.
2. To summarize the advantages of and objections to the use of emulsion muds.
3. To stimulate the funneling of additional data and information to the study committee.

The earliest use of oil in rotary drilling is not known, but for many years it has been used occasionally to accomplish a variety of results, such as loosen stuck drill pipe, "slick up" the hole prior to running casing, and drilling-in for completion. During the past few years oil has been added to practically all types of water-base drilling fluids to form as oil-in-water emulsion. This fluid has been used in both drilling and completion operations. Reports of field results indicate that the presence of emulsified oil in mud does improve its performance.

The terms "emulsion mud," or "oil-emulsion drilling fluid" are used to refer to any water-base drilling fluid containing oil and an emulsifying agent. Numerous combinations of different drilling fluids, emulsifying agents, and oils are possible. To permit a better interpretation of the results obtained with emulsion muds, it is felt that a distinction should be made between the emulsifying agents used for stabilization, the drilling fluids to which the oil is added, and the oils used in the emulsion.

Emulsifying Agents

An emulsion is formed if two immiscible liquids, such as oil and water, are shaken together to suspend droplets of one liquid in the other. In order to prevent the coalescence of the droplets to form separate layers when agitation is stopped, an emulsifying agent must be added to stabilize the emulsion.[1,2,3] Examples of the various materials which serve as emulsifying agents in drilling fluids are:

1. Soaps, such as salts of higher fatty acids.
2. Lignitic compounds and lignosulfonates.
3. Organic colloids, such as starch and carboxymethyl cellulose.
4. Powdered solids, such as bentonite, shale, and silica.

The theory regarding the manner in which these products stabilize an emulsion is highly controversial, as no one theory will satisfactorily explain the fact that so many different materials will produce stable emulsions. These is general agreement that the stabilizing action depends upon the concentration of the emulsifying agent at the interface between the internal and external phases of the emulsion. It has been suggested that the mechanism of the stabilization by the above classes requires one or a combination of the following effects at the interface:

1. Lowering of the interfacial tension.
2. Setting up of an electrical charge.
3. Formation of insoluble films.
4. Adsorption of solid particles.

These four mechanisms are closely related to the four examples of emulsifying agents, as each mechanism has been given to explain the action of the materials in each class. It is probable, however, that each class is affected to varying degrees by a combination of several of the mechanisms.

In emulsion drilling fluids, the oil-in-water type of emulsion is prepared. Already present in most drilling fluids are emulsifying agents falling into one or more of the classes previously mentioned. Shales and bentonites are usually in the mud, representing the powdered solids class. Starch may be present, representing the organic colloid class. If oil is added to a mud containing any of these emulsifying agents, an emulsion will be formed. However, in order to form a more stable emulsion, an additional emulsifying agent is generally added at the same time the oil is introduced into the drilling fluid. This emulsifying agent may be incorporated in the oil added or it may be added separately while adding the oil.

It should be emphasized that the properties of the emulsion with respect to its stability to dilution, temperature, agitation during circulation, and contamination by sodium or calcium compounds are dependent upon the emulsifying agent used. Some emulsifying agents lower the surface tension of the water in the drilling fluid, others do not. Some emulsifying agents, when modified by contamination, tend to invert the oil-in-water emulsion to the water-in-oil type. Since more than one emulsifying agent is usually present in drilling fluids, consideration should be given to the effect of adding an additional emulsifying agent on those already present.

The Drilling Fluid

Oil has been used as an additive to form an emulsion in the following types of drilling fluids:

1. Low-pH sodium base.
2. High-pH sodium base.
3. Lime base.
3. Saturated salt water.
5. Sodium silicate.

The preparation and maintenance of each of these drilling fluids without oil as an additive has been described in the literature and has been practiced in field operations for several years. It is well known that contaminants affect each of the muds to a different degree, and that the corrective treatment of the fluid to overcome the effect of the contaminant may vary considerably with the different muds.

When oil is added to any of the muds above and is properly emulsified, it exists as small stable droplets in that mud. The fluid phase of the original mud is still the continuous phase, and the emulsified oil does not alter appreciably the effect that contaminants would have on that type of mud without the oil. Neglecting the effect of the contaminant on the emulsifying agent, the corrective treatment to overcome contamination would be the same as originally used before adding the oil.

When comparing the properties of muds containing emulsified oil and

when describing the effect of contaminants, the type of the base drilling fluid should be considered. It must be realized that the mere addition of oil to drilling fluids does not reduce all of them to a common type that may be described completely by the single term "oil-emulsion mud."

Oils

The oils that have been used in preparing emulsion muds may be divided into two classes, viz., refined oil and crude oil. The refined oils include gas-oil and diesel oil. The crude oils include weathered and unweathered crudes with gravities varying from 16° to 60° A.P.I. The hydrocarbon content has varied in degree of saturation and aromatic content. Some of the crudes have been sweet; others have been sour.

With the wide variation in the types of oil that have been used, it is apparent that certain differences reported in the use of emulsion muds may be attributed to the kind of oil used. The type of oil can influence the ease of emulsification, the stability of the resulting emulsion, the lubricating properties of the mud, the fluorescence of the mud, the odor of the mud, and the effect on rubber in contact with the mud.

Specific information as to the best type of oil to use in preparing oil-emulsion muds does not seem to be available. There does appear to be a preference for using a refined fraction such as diesel oil with the following specifications: Gravity, 28° to 36° A.P.I.; flash point, above 190° F.; aniline number, above 155. Other refined oils or crude oils may be used for economic reasons; however, the above specifications should serve as a helpful guide in selecting a suitable oil for use in preparing emulsion muds.

Preparation and Maintenance of Emulsion Muds

If the differences in emulsifying agents, base drilling fluids, and types of oil are kept in mind, certain observations may be made regarding the preparation and maintenance of emulsion muds in general.

1. The particular mud to which oil is to be added must possess the desired properties before adding the oil. The oil should not be considered as a conditioning agent for a bad mud. It is added to improve the performance of a well-treated mud.

2. The amount of oil added has varied between 5 and 30 per cent, depending upon the properties desired. Improvement in the lubricating properties of the drilling fluid is noted with as little as 5 to 10 per cent oil by volume. As this oil percentage is increased the water loss is lowered. Most of the emulsion muds used to date have contained 10 to 20 per cent oil by volume.

3. The oil may be added to the pump suction or to the mud pit and emulsified with the mud gun. The oil should be added slowly to distribute it evenly through the mud system. If oil is added to a weighted mud, the addition must be controlled so that weighting material can be added to prevent the lowering of the hydrostatic head of the mud column.

4. When an emulsion is prepared in a mud containing lignitic or lignosulfonate compounds as the dispersant and this compound is to serve also as the emulsifying agent, it has been observed that additional amounts of the compound should generally be added to properly emulsify the added oil.

5. When soaps are used as the emulsifying agent in lime-base muds, it has been found that the properties are better controlled if the phenolphthalein alkalinity of the filtrate is maintained above 7 cc. of N/50 H_2SO_4 per cc. of filtrate.

6. The filtrate of emulsion muds should be closely observed during the drilling operation. This filtrate should be a clear water with no oil separating or emulsified in it. If an emulsion is obtained as the filtrate, it indicates that the solids in the mud are not properly dispersed to form capillaries of a size that can be plugged by the droplets of oil. If oil separates as a layer in the filtrate, it indicates that insufficient emulsifying agent is present in the mud or that contaminants are destroying the stabilizing properties of the emulsifying agent.

7. The maintenance of the emulsion mud is the same as that for the drilling fluid to which the oil is added. If the concentration of oil falls below the value desired, additional oil and emulsifying agent may be added.

8. Oil-resistant rubber should be used wherever rubber is to come in contact with an emulsion mud. This includes the piston rubbers and the valve inserts of the mud pumps, and the rubber pipe protectors.

Questionnaire on Emulsion Muds

A questionnaire was prepared by the study committee on drilling fluids to obtain additional data concerning the effect of emulsion muds on the drilling operation, the geological interpretation of logs and samples, and the completion operation. The numerical data received thus far in answer to the questionnaire, together with the data and information previously published or discussed in meetings of the study committee, are used in the discussion to follow.

It is realized that the values given in supporting the following discussion represent only a fraction of the total data available; however, it is felt that the answers to the questionnaire do represent a cross-section of the results that might be expected in the use of emulsion muds.

At the time of preparation of this report, information had been obtained on 101 wells using emulsion muds. All of these wells were not drilled in locations or under conditions which would permit comparison with wells using ordinary mud. Only those wells where the operator felt that a comparison was possible were used in evaluating the relative performance.

Effect of Emulsion Muds on Drilling Operations

Papers published by Van Dyke,[4] Nichols and Walters,[5] and Weichert and Van Dyke[6] have discussed in detail case histories where advantages have been noted in the use of oil emulsified in the drilling fluid. These individual case histories will not be repeated in this report. However, the results reported in the use of the emulsion during drilling operations will be discussed briefly.

1. **Drilling rate.**—The increased drilling rate upon the addition of oil has been evidenced in two ways:

(a) An increase in the rate of penetration immediately on the addition of oil. This increase has been observed by different companies in different areas. Fig. 1 shows this increased rate on a well in South Louisiana. The electric log on this well indicated no change in the type of formation being drilled immediately after the addition of the oil.

(b) A decrease in the drilling time

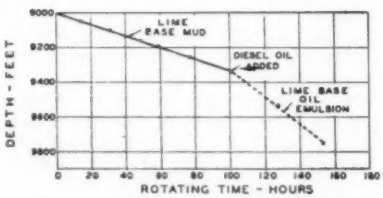

Fig. 1—Increased drilling rate after adding diesel oil to lime-base drilling mud, South Louisiana area.

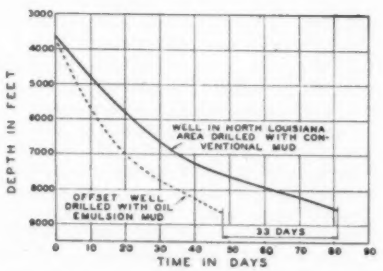
WELL IN NORTH LOUISIANA AREA DRILLED WITH CONVENTIONAL MUD
OFFSET WELL DRILLED WITH OIL EMULSION MUD
33 DAYS
DEPTH IN FEET
TIME IN DAYS

Fig. 2—Comparative drilling rates between conventional and oil-emulsion drilling muds.

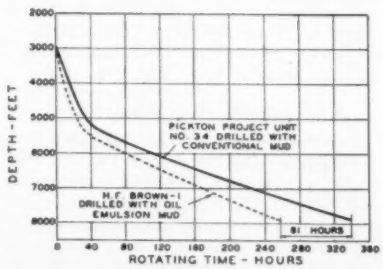
PICKTON PROJECT UNIT NO. 34 DRILLED WITH CONVENTIONAL MUD
H.F. BROWN-1 DRILLED WITH OIL EMULSION MUD
51 HOURS
DEPTH - FEET
ROTATING TIME - HOURS

Fig. 3—Comparative drilling rates between conventional and oil-emulsion drilling muds.

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or rotating hours for offset wells drilled under as nearly the same conditions as possible, with the exception that an oil-emulsion mud was used in the wells drilled more rapidly. Fig. 2 shows graphically the decrease in drilling time on a well in the North Louisiana area. Fig. 3 shows the decrease in rotating time for a well in Picton field of East Texas. In this case the drilling rate of the well using the emulsion mud was compared with the well in the field having the fastest drilling rate using ordinary mud.

The data on drilling rate change with emulsion muds available in the literature and received in answer to the questionnaire may be summarized as follows:

Number of wells compared	32
Number showing increased rate	28
Number showing decreased rate	0
Number showing no change	4
Percentage increase	5-160

The lowest percentage increase was reported in drilling the chert and hard lime formations of West Texas with 5 and 8 per cent increases in two cases reported for that area.

2. **Bit life.**—The data available on increased bit life with the use of an oil-emulsion mud follows:

Number of wells compared	23
Number showing increased life	18
Number showing decreased life	2
Number showing no change	3

Those cases showing increased bit life varied in percentage increase from 5 to 52 per cent. The two cases having a decreased bit life showed decreases of 15 to 26 per cent. These two cases were in the chert and limestone formations of West Texas; however, two of the cases showing increased life of 5 and 20 per cent were in the hard shale, limestone, and chert formations of the same area.

3. **Bore-hole conditions.**—There is general agreement among the users of emulsion muds that bore-hole troubles encountered in the drilling operation have been minimized with the use of the emulsion muds. The improvement has been noted in decreased heaving of shales and less balling of the bit and drill collars. This has resulted in less lost time spent in reaming after trips, in spudding to clean balled bits, and in fishing for stuck drill pipe. The literature and reports to the study committee have indicated that the use of emulsion muds has been especially helpful in directional-drilling operations because of the improved bore-hole conditions and the reduction of torque. Caliper logs of the open hole which have been submitted to the committee have shown less hole enlargement in wells drilled with emulsion muds than in wells drilled with ordinary muds.

Answers to the questionnaire reported 54 comparisons between emulsion and ordinary mud jobs. In each case compared, improvement was noted in bore-hole conditions.

4. **Effect on mud pumps.**—In the comparison of 81 wells using emulsion muds, 76 cases indicated no increase in pump troubles; in fact, one operator with 26 emulsion jobs reported that the emulsion mud was generally easier on the pumps. In the other 5 cases, an increase in the replacement of pump parts was noted. The pump parts requiring the most frequent replacement were the rubber pistons and valve inserts. In cases where rubber deterioration is taking place when oil-resistant rubber parts are used, the trouble may lie in one of the following:

(a) The oil used in preparing the emulsion may be too high in aromatic content. The aniline number, which is indicative of the aromatic content, should be above 155.

(b) The oil emulsion may not be stabilized. If the emulsion is not stable, the oil may come in contact with the rubber parts and cause more rapid deterioration than a properly stabilized emulsion.

5. **Economy.**—The increase in the cost of the emulsion mud over ordinary mud will vary from $1 to $2 per barrel of mud in the system, depending upon the concentration of oil desired. To determine whether the use of oil is economical, the saving in bits, rig time, and mud maintenance must be compared with the increased cost of adding the oil. Cases have been reported in which the mud costs have been less where emulsion muds are used because of the decrease in maintenance cost.

In those cases where improvements have been noted in the drilling operation upon the addition of oil to the drilling fluid, the improvement may be explained by the following:

(a) The lubricating property of the oil.

(b) The lower water loss to the formation.

(c) The prevention of balling.

The improvement in drilling rates, bit life, and bore-hole conditions has been reported for emulsion muds prepared in the various types of drilling fluids using all types of oil and emulsifying agents.

Geological Interpretation

The geological interpretation of electric logs, side-wall samples, and cores when using oil-emulsion muds, has been the subject of considerable discussion ever since the recent widespread use of oil in drilling fluids. The enhanced value of the emulsion mud in the drilling operation met with the immediate approval of the drilling departments of most companies. The geological departments of some companies, however, were reluctant to use emulsion muds because of the possible masking of oil shows in formation samples by the oil in the mud.

The answers to the questionnaire concerning the effect of oil emulsified in drilling fluids on the electric log, side-wall samples, and cores may be summarized as follows:

1. Electric logging.	
Number of wells reported	78
Number satisfactory	78
Number unsatisfactory	0
2. Side-wall sampling.	
Number of wells reported	65
Number interpretation unaffected	34
Number interpretation affected	31
3. Coring.	
Number of wells reported	23
Number interpretation unaffected	20
Number interpretation affected	*3

*Side-wall cores.

The only cases where correct interpretation of geological information was affected were in side-wall sampling. The effect of the oil in the mud was noted in the odor test for gas shows and in the fluoroscopic examination of side-wall samples and cores. The odor of the oil in the mud made difficult the correct identification of gas in gas sands from the side-wall samples alone. The fluorescence of the oil in the mud presented a problem in the identity of gas and/or water sands from side-wall samples alone. However, the difference in the color of the fluorescence of the oil in the mud and the oil in place permitted the identification of oil sands. Although 31 cases were reported where the oil affected the interpretation of side-wall samples, the notation was made in the questionnaire that 16 of the 31 were only slightly affected.

The usual mud-logging operations have been carried on successfully in wells drilled with oil-emulsion muds. Generally, there is a relatively constant show of gas from the oil in the mud. There is a marked increase in gas content when gas-bearing formations are penetrated. The fluorescence of the oil in the mud is dull in contrast to the live oil from the formation. If refined oil is used in mud, the color of the fluorescence is distinctly different from that of the formation oil.

Completions

Cases have been reported by Van Dyke[4] where greater productivity has been obtained from wells drilled with an emulsion mud than from offset wells drilled with an ordinary mud. It is felt that the principal advantage of the emulsion mud over ordinary mud in improving the productivity is the decrease in the amount of water entering the formation. It has been suggested that other factors affecting the productivity may be the surface tension of the emulsion-mud filtrate and the effect of the filtrate on hydratable materials in the sand.

The effect of emulsion muds on completion operations reported in the answers to the questionnaire may be summarized as follows:

Number of wells compared	40
Number with improved completion	10
Number with no change	30

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Number with impaired completion	0

The remarks on the completion operation indicate improvement in the completion of a low-permeability formation and greater ease in bringing in and cleaning the well. Three operators reported one case each of improvement in completion operations, and one operator reported seven cases of improvement. Three operators, two with 2 cases each, and one with 26 cases, reported no change in completion operations.

It should be pointed out that the questionnaire was sent only to operators in the Gulf Coast area where completions are not particularly troublesome in the majority of cases. In the Gulf Coast area, oil-emulsion muds have been used principally to improve bore-hole conditions and increase the rate of drilling rather than improve completions.

Conclusions

1. The data presently available to the study committee have indicated that the use of emulsion muds has definite advantages over ordinary muds in the drilling operation by increasing the drilling rate and bit life, and by minimizing bore-hole troubles.

2. The preparation and maintenance of an oil-emulsion mud present no dificulties if it is remembered that the type of ordinary mud to which the oil is added is the controlling factor in the maintenance of the emulsion mud.

3. Emulsion muds do not affect the correct geological interpretation of electric logs or conventional cores.

4. The information on the effect of emulsion muds on completions indicates either an improvement or no change in completion operations.

5. Most operators report no effect of emulsion muds on the mud pumps.

6. More information should be obtained to permit a more detailed study of the effect of the various types of emulsifying agents, drilling fluids, and oils on the geological interpretation, completion operations, and rubber deterioration.

References

1. Alexander, Surface Chemistry and Colloids, Colloid Science, Chemical Publishing Co., Inc., (1947).

2. Alexander and Johnson, Colloid Science, Vol. II, Oxford Press (1950).

3 Dawson, L. R., and Browning, W. C., Kembreak Emulsion Muds, The Milwhite Company, Inc.

4. Van Dyke, O. W., Oil Emulsion Drilling Mud, World Oil 131, p. 101 (Nov. 1950).

5. Nichols, L. W., and Walter, J. W., Observations on the Use of a Kembreak-Oil Emulsion Mud in a Field in North Louisiana and in a Field in the Gulf of Mexico. Paper presented at Mid-Continent Meeting of Petroleum Branch of the A.I.M.E., New Orleans, October 4-6, 1950.

6. Weichert, J. P., and Van Dyke, O. O., Effect of Oil Emulsion Mud on Drilling, Petroleum Engineer, 22, 12, p. B-16 (Nov. 1950).

STEEP-INCH LINE

. . . Meets Increased Products Demand in Caracas, Venezuela

ALTHOUGH it runs over the mountains for a distance of only 10.4 miles, from Catia de la Mar on the Caribbean Coast to Caracas, capital of Venezuela, the recently completed Tacagua products pipe line well merits the name "steep inch." One of the world's steepest pipe lines, the new 8⅝-in. o.d. line begins at an elevation just above sea level, rises sharply to about 2,300 ft. over a spur of the Sierra del Avila range, drops roughly 1,000 ft. to the Tacagua Valley, then rises again at a more gradual rate to a crest of 3,300 ft.

At five different points the line crosses the new superhighway being built from Caracas to the coast and also crosses the 190-ft. bridge over the Quebrada Tacagua at Boqueron. With grades reaching a maximum of 45 per cent in places, it was necessary during construction to lower the pipe from above at certain points and to winch it into position at others.

This line, completed at a cost of approximately $6,200,000, has been built as a joint enterprise by Creole Petroleum Corp. and Shell Caribbean Petroleum Co. Construction was by Macco Pan Pacific Co. which has engaged in highway and other construction projects in the Caribbean area.

"STEEP-INCH" TERRAIN.—Although only 10.4 miles in length, the new products line serving Caracas, Venezuela, is one of the world's steepest. The line runs over mountainous terrain from Catia de le Mar on the Caribbean coast to the Venezuelan capital. In places grades reach a maximum of 45 per cent.

Replaces Other Facilities

The new line replaces previously inadequate transportation facilities which consisted of a 2½ and 4-in. system running from the seacoast terminal at Catia de la Mar to Boqueron, located halfway from the coast to the capital. From Boqueron shipments went by trucks and tank cars to Caracas, being augmented by tank trucks making the full 20-mile haul over the mountains on the Catia de la Mar-Caracas highway.

There has been an increased demand for petroleum products in Caracas, a demand now estimated to be over 8,000 bbl. daily. Since 1946, kerosine consumption has tripled. In the same period, a sharp increase in automobile registrations in the Venezuelan capital has more than doubled the demand for gasoline.

The new pump station at Catia de la Mar houses three Bingham pumps, two operated in series, and the third as standby, each capable of delivering 1,500 bbl. per hour of gasoline at 620 psi. differential. The prime movers are Cooper-Bessemer 4-cycle, 450-r.p.m., 580-hp. diesel engines. These have been installed for remote air starting and emergency stopping from the control room. Engine speed may be controlled manually, or automatically through pump-case pressure. Speed increasers are used to obtain 3,600 r.p.m. at the pump drive shaft. Three single-stage, two-speed booster pumps, each rated at 1,500 bbl. per hour at 37 psi., have also been installed. Any two of these can be operated in series, with the third acting as standby or used as a transfer pump.

Depending on the gravity of the product, ranging from aviation and motor fuels to diesel oil, line pressure may be as high as 1,300 psi. Discharge pressure is 50 psi.

As noted, the line can deliver 1,500 bbl. per hour of gasoline, 1,200 bbl. per hour of kerosine, or 1,000 bbl. per hour of diesel fuel.

Creole has constructed terminal facilities of 194,500 bbl. at Catia de la Mar where products are shipped from the Creole refineries at Caripito and Amuay Bay; and of 87,500 bbl. in Nueva Caracas on the northern outskirts of the city. Tankage at both terminals was erected by Chicago Bridge & Iron Co. Shell's storage facilities at Caracas can handle 53,500 bbl.

Training of Venezuelan nationals in products dispatching and other work connected with the new line is in progress, F. M. radio, teletype, and telephone provide communication facilities for the line. Patrol of the line is carried out by inspectors riding mules.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Noncondensable Gases Handled During Vacuum Distillation

How does one estimate the pounds of air that have to be continuously removed from a vacuum still (and auxiliaries) during operation? Are estimates of the air leakage based solely on experience, or are there reliable figures in the literature for air leakage through flanged joints, valve and stuffing boxes and the like? What part does maintenance play in the estimate of air leakage?—H.S.K.

Upon investigation it has been found that noncondensable gases are estimated today in much the same way as they were estimated 20 years ago when vacuum stills were first installed in large numbers. The noncondensable gas is used as simply 15 to 50 lb. of gas per 1,000 bbl. of feed stock. Such figures apply to heavy oil stills producing lubricating oils, gas oil, or asphalt. They are probably too small for such operations as the rerunning of heavy naphthas under vacuum. Although many illustrations of ejector design in the literature assume figures such as the above, only one definite statement has been located in the literature, namely, Charles T. Chave, "Vacuum Equipment in the Oil Refinery," Part 2 (Pet. Engineer, March 1936, p. 49). He states, "From 25 to 60 lb. per hour of 30-mol. wt. gas per thousand barrels of feed per day should be allowed in rating ejectors for vacuum stills. . . At the present stage of development, experienced gambling is the only known method of estimating the required ejector capacity." This statement is particularly convincing because it represented collaboration with major contractors and ejector manufacturers of that period.

The term "air leakage" used in the question and used so frequently in speaking of ejectors, is unfortunate because these are strong indications that the noncondensable gases arise mainly from dissolved air or gas, mild thermal decomposition, and light ends in the charge stock rather than by leaks. Obviously, leaks are very bad and everything possible must be done to eliminate them. The lower value of 15 lb. per hour for 1,000 bbl. per day capacity is a large amount of air. At atmospheric pressure it is the equivalent of about 3.3 cu. ft. per second or even 50 cu. ft. at a pressure of 50 mm. and 60° F. The larger figure (50 lb.) would represent for a 10,000-bbl. per day unit, the enormous amounts of about 110 cu. ft. per second at atmospheric or 1,660 cu. ft. at 50 mm. Such leaks should be audible in a static system while tests are being conducted. With regard to maintenance, it should be noted that only the parts of the equipment directly subjected to vacuum need be considered. This eliminates much equipment such as the charge pumps, pipe stills, much of the exchanger system, and everything past the product removal pumps. On occasions, the author has found it necessary to seal the stuffing boxes on the pumps by building a seal bath around each stuffing box. The seal bath was kept full of suitable oil.

The solubility of air in water (boiler feed) is indicated in Table 1 (Handbook of Chemistry and Physics). Similar data on oils are not available, but it has been well established that the solubility is very much greater, approaching tenfold. Approximate data on oxygen and some other gases (Petroleum Refinery Engineering, third edition, p. 171, McGraw-Hill Book Co., Inc., 1949, and Gurwitsch-Moore, Petroleum Technology, p. 265, D. Van Nostrand, 1932) are indicated in Table 2. From this table it might be concluded that the solubility of air in oil is approximately as follows:

Cc. per 1,000 cc.	134
Cu. ft. per 1,000 bbl. per day	31.4
Lb. per 1,000 bbl. per day	2.3

TABLE 1—SOLUBILITY OF AIR IN WATER

Temperature °C.	Temperature °F.	Cc. per 1,000 cc.	Cu. ft. per 1,000 lb.	Lb. per 1,000 lb.
0	32	29.18	4.67	0.36
5	41	25.68	4.11	0.31
10	50	22.84	3.68	0.28
15	59	20.55	3.29	0.25
20	68	18.68	3.0	0.23
25	77	17.08	2.74	0.21
30	86	15.64	2.51	0.19

TABLE 2—SOLUBILITY OF GASES IN OILS, cc. per 1,000 cc.

Temp. °F.	Oxygen: Gas oil & Trans. oil	Oxygen: Paraffin oil	Oxygen: Oil	Nitrogen: oil
50	...	...	229	135
65	...	114		
68	...	...	202	117
77	155	...	...	...

These two items, air dissolved in water and oil, only account for a maximum of 2 or 3 lb. of air per hour for each 1,000 bbl. per day processed. and in regular operations it would not be expected that the incoming stocks (water and oil) would be saturated with air. Nevertheless, hydrocarbon gases or a tail of light ends, are relatively much more soluble in an oil than air. Thus, tails of exceedingly small amounts of material are large in pounds per hour. Thus, very small tails on a true-boiling-point basis (negligible in A.S.T.M. or ordinary distillations) represent the following pounds per hour for 1,000 bbl. per day capacity:

Tail, per cent	Lb. gas per hour
1	125
0.4	50

Finally, the tail of light material produced by decomposition represents approximately 10 per cent by weight on the feed. This applies to either pressure cracking where the gas loss is at least 10 per cent, or to vacuum decomposition where the tail of lighter materials than that desired is 5 to 10 per cent. Thus, although cracking or thermal rearrangement is limited to even the small amounts of 2 to 5 per cent during the heating, tails of light material amounting to 0.1-0.5 per cent result and amounts of noncondensables ranging from 10 to 60 lb. per hour.

From all the above it becomes clear that the amount of noncondensables that an ejector must handle will probably not be an easily estimated quantity until we have accumulated far more data. However, three useful generalizations appear: (1) the feed stock and feed water should be kept in a deaerated state, (2) the feed stock should be thoroughly stripped, and (3) decomposition or overheating should be avoided, particularly for low pressures (40 mm. or lower). All of this, of course, presupposes a system that is reasonably free of leaks.

Refinery Accounting References

Can you direct us to a book on refinery cost accounting?—P.M.C.

Apparently no books are available on this subject. The Business Administration School of the University of Tulsa (Dean M. M. Hargrove) is giving the matter its attention. It is planned and hoped that refinery accounting will be discussed, among other petroleum industry topics, at the annual accounting conference which will be held during May of this year.

Undoubtedly one of the main reasons for the lack of books or even literature is the close interrelationship between processing, engineering, chemistry, and accounting in the refining industry. Much of the refining equipment is tailor made for the particular refinery, rather than being offered on the market as a packaged job having a standard price. The multitude of byproducts, including intermediate stocks which are used in the refinery and never reach the market as such, also complicates the accounting. Finally, the processing operations are so interwoven that they cannot be easily dissected into the costs that apply to a particular product or a particular operation. Thus, a close cooperation among the chemist, process engineer, superintendent, and ac-

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countant must be established when setting up accountancy methods.

For these reasons, nearly anything that has to do with costs or processing becomes the province of refinery accounting. Thus the references given are general ones which do not pertain directly to accounting but which may help to establish certain phases of refinery accounting. Only a few references pertain directly to accounting, and one of the best of these is that of Skinner of Socony-Vacuum Oil Co., Inc. Although some of the references are quite old, they should treat of much the same problems as those encountered today.

References

1. Skinner, E. M.—Refinery Cost Accounting, W.P.R.A., Wichita, Kansas, meeting of June 10, 1949.
2. Holsten and Votrain — Refinery Costs Versus Selling Price, The Oil and Gas Journal, March 6, 1930, p. 192.
3. Anon. — Refinery Cost System Needs Cooperation of Chemist, Engineer and Accountant, Nat. Pet. News, January 1, 1936, p. 25 (A report on a paper by Gordon Kerr before the Institution of Pet. Technologists —London).
4. Kerfoot, R. E.—Budgets and Costs, Ref. Nat. Gaso. Mfr., January 1931, p. 102.
5. Votrain, C. E.—Refinery Cost Accounting, Ref. Nat. Gaso. Mfr., November 1929.
6. Kerfoot, R. E.—Elements in Refining Costs, Ref. Nat. Gaso. Mfr., January 1932, p. 37.
7. Peterkin and Jones—Cost Accounting and the Chemical Engineer, 2 Parts, Ref. Nat. Gaso. Mfr., Feb. 1933, p. 58 and March 1933, p. 100.
8. Van Noy, et al.—Guide for Making Cost Estimates for Chemical-Type Operations, Rept. of Invest. 4534, U. S. Bur. of Mines, November 1949.
9. Nelson, W. L.—Cost-imating Series, The Oil and Gas Journal, October 21, 1948, p. 141, weekly through December 29, 1949, p. 81. (Detailed costs of items of plant equipment and of labor costs in constructing them, based on 1946 and with indexes carried currently in The Oil and Gas Journal for obtaining present values).
10. Nelson, W. L.—Profit per Barrel of "Extra" Throughput, The Oil and Gas Journal, May 5, 1945, p. 113.
11. Nelson, W. L.—Liquids from Refinery Gases are Valuable, The Oil and Gas Journal, September 1, 1945, p. 81.
12. Nelson, W. L.—Amortization and Depreciation Rates, The Oil and Gas Journal, February 3, 1949.
13. Nelson, W. L.—Operating Cost Index, The Oil and Gas Journal, July 13, 1950, p. 98.
14. Nelson, W. L. — Proper Price for Straightrun Residuum, The Oil and Gas Journal February 8, 1951, p. 109.

Coldest Water From Cooling Tower

I understand that a cooling tower should cool the water to the wet-bulb temperature of the air. Our tower never does this. What is the trouble? —F.C.P.

As water evaporates into air, it cools itself by evaporation. If the air is very dry, the water temperature (wet-bulb) will be low and vice versa. However, to attain the wet-bulb temperature requires a very large amount of air, or otherwise the air will become partly moist and thus will not cause as much evaporation. Secondly, the temperature of the air tends in some degree to warm (or cool) the water by sensible heat.

As air passes through a cooling tower, it is relatively dry as it contacts with the first droplets but as it travels across the tower it becomes richer in moisture and its wet-bulb temperature increases. Thus, the mixture of water that issues from the tower is warmer than the wet-bulb temperature of the inlet air. Many cooling-tower operators take advantage of this situation by collecting the water in two parts—a cold portion for use in condensers or for absorption oil and a warmer portion which is used for services that do not require cold water, such as engine cooling or the cooling of high-boiling products such as gas oil or fuel oil.

Maintenance Costs

Can you supply us with maintenance costs as a per cent of plant investment, as a per cent of net sales or gross sales or any other comparable item? Our operations (a chemical manufacturing plant including a power house and all utilities) are quite similar to refinery operations, or more particularly petrochemical operations. We wish to know if our maintenance record is good and have no means of comparison.—W. W. S.

This department does not have sufficiently complete information to serve as a basis for comparison. Such a comparison would require more than percentages because maintenance expenses are carried in so very many different ways that the complete debits for an operation would have to be examined.

Most generally, maintenance is thought of as about 4 per cent per year of the plant investment. Often it is thought of as being about equal to the depreciation rates set up by the Bureau of Internal Revenue (Bull. "F" of the U. S. Treasury Department). However, when processing "sour" or corrosive stocks, the maintenance may be larger by as much as 50 per cent, but of course, may not be larger if sufficient corrosion-resistant materials have been employed. Note, however, that a more expensive original construction appears as a larger depreciation cost rather than as a larger maintenance cost.

Aries and Newton in their "Chemical Engineering Cost Estimation" (Chemonomics, Inc., 400 Madison Avenue, New York) summarize maintenance as:

2-3 per cent of plant cost—simple, slightly used.

7-10 per cent of plant cost—complicated equipment.

4 per cent of plant cost—average.

D. E. Pierce in the March 1948 issue of Chemical Engineering Progress, describes maintenance in terms of the power consumption, labor, and materials, but his relationship does not appear to be directly useful.

The author has thought of refinery maintenance as representing the following percentages of the total operating cost:

Mainly distillation operations, 9-17 per cent.

Topping and thermal cracking, 12-20 per cent.

Complete with catalytic cracking, 24 to 38 per cent.

With corrosive stocks the maintenance will be even larger.

Finally, maintenance is so intimately related to depreciation, retirement of investment, improvements or changes in operation, and even new constructions, that nothing more than generalities can be stated.

Heating No. 5 Fuel Oil

We understand that A.S.T.M. fuel oil No. 5 need not be heated. However, we find great variations in the performance of our oil-burning installations and we wonder if the specifications are right?—G. C. B.

Although No. 5 fuel is often described as not requiring preheat, it should be noted that it is described by the A.S.T.M. in its specification D396-48T as "a residual-type oil for burner installations equipped with preheating facilities." In order to obtain proper atomization, the oil should have a viscosity of 130-250 seconds Universal Saybolt (steam atomizing) at the firing temperature, and if it is a gas oil rather than a residual fuel the viscosity may have to be even lower. Distilled oils have a little poorer atomizing properties than residual fuels. The temperatures required for atomization of the common fuels are about as shown in Table 1.

TABLE 1—OIL TEMPERATURES FOR PROPER ATOMIZATION

Fuel name—	Viscosity (min. and max.)	Minimum temperature, °F. Mechanical atomization	Minimum temperature, °F. Steam atomization
A.S.T.M. No. 4	45 Universal at 100	30- 80	Above pour point
	125 Universal at 100	100-140	75-100
A.S.T.M. No. 5	150 Universal at 100	110-150	80-105
	40 Furol at 122	140-200	110-140
Bunker C	150 Furol at 122 (max.)	190-240	150-190
A.S.T.M. No. 6	45 Furol at 122	150-205	110-150
	300 Furol at 122	210-265	170-210

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Automatic Operation

of lube-oil and engine cooling-water systems at United Gas Co.'s Dallas compressor station

by Carl Hoot
Dallas District Editor

HANDLING of engine cooling water and lube oil at United Gas Co.'s Dallas compressor station is in keeping with the fully automatic operation of the plant *(see The Oil and Gas Journal, December 29, 1950, page 58)*.

Both cooling water and engine oil are transferred to and from storage and the cleaning system by compressed air, from the engine-starting outfit. Makeup water, antifreeze for winter operation, and dirty-oil receiving tanks are underground.

Automatic operation of the station cuts the four 300-hp. engine-compressor units in and out of service and consequently starting and stopping increases condensate water in the lubricating oil. This problem was neatly handled by the installation of a rapid transfer system, plus water-settling tanks and an oil purifier.

Each engine-oil reservoir is equipped with an inlet and outlet which tie into one line to the underground oil receiving tank. By shutoff valves, this line also serves to fill the engines from the storage tanks in the oil house. The aboveground new-oil storage tank has a separate supply line to the engines.

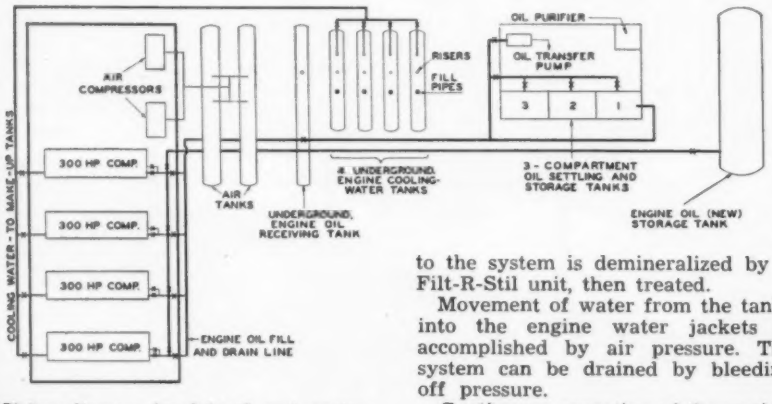
In operation, each of the valves on the engines is closed. When draining an engine the oil is bled off into the underground tank. The oil is immediately transferred by air pressure from the receiving tank to the settling tank in the oil house where it is allowed to stand from 2 to 3 hours to let the water drop out. From the settling tank the oil is transferred to a Honan-Crane heater and filter unit, then to storage in the oil house.

Makeup cooling water, and glycol as an antifreeze agent, are stored in four underground tanks. Water added to the system is demineralized by a Filt-R-Stil unit, then treated.

Movement of water from the tanks into the engine water jackets is accomplished by air pressure. The system can be drained by bleeding off pressure.

Continuous operation of the station, which is feeding 60,000,000 cu. ft. of gas daily into United's pipe line from Mineola to Dallas and Fort Worth, is handled by engineers Andy Turner and M. E. Gipson.

(1) Ten-horsepower motor supplies starting air for compressor units and for transferring lube oil and cooling water. Pressure for the latter use is 7 to 8 psi. in summer and 15 psi. in winter. At left is standby compressor powered by air-cooled engine. (2) Gocsenecks above underground tanks serve as bleeders to relieve pressure on the four 500-gal. water tanks and one 450-gal. dirty-oil receiving tank. Pit in the foreground contains inlet and outlet valves to the tanks. Long tanks in the background are for compressed air. (3) The "oil house," inside is a three-compartment tank for settling water out of the oil, oil storage, transfer pump, and filtering unit. (4) New-oil storage tank is also pressurized to feed oil to the compressor plant engines.



Piping diagram for lube-oil and engine cooling-water systems.

BOOKS

MAP OF OFFSHORE LEASE BLOCKS IN THE GULF OF MEXICO. Published by Langham, Langston & Burnett, 3700 Montrose Boulevard, Houston. $2.50.

This 34 by 21-in. two-color map identifies Texas and Louisiana offshore lease blocks by number from Brownsville through the delta. It indicates offshore discoveries, water depths, sedimentation lines, and other pertinent information including some data indicating the percentage probability of tropical storms affecting various offshore areas during the hurricane season, June 1-October 31. It gives a general picture of the potential scope of operations in the open waters of the gulf and offers a frame of reference for the executive interested in specific operations or leases on this new oil and gas frontier.

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CORROSION and its control

Pipe Thickness as Related to Pipe Life

THE term "pipe life" is of extreme vagueness when applied to buried pipe lines, because of the highly dispersed nature of attack by soil corrosion, even in uniform soils. It is possible, with sufficient repairs, to keep any pipe line in operation indefinitely, although it may become more economical to replace it. It is even more common to keep a line in operation indefinitely by making periodic partial replacements; the resultant complexities in partial pipe life soon make the entire concept untenable. Two alternative ideas have been suggested as more worthy of attention than this indefinite term: (1) the total annual cost of keeping a given line in service, including losses from failures and all expenditures for repairs and for measures designed to mitigate damage; and (2) the salvage value of a given line after a certain term of service. The latter idea may be the only way to evaluate a mitigation program when the exposure is so mild that no appreciable number of leaks are anticipated—all the damage done appears as diminished salvage value only.

The question being considered here is that of the justification of wall thickness in a pipe line in excess of that required by the operating conditions taken into account in the design —extra thickness added, not as an ordinary safety factor, but solely as a corrosion allowance. The evaluation of the proposed expenditure for this extra metal should be made by comparing either (1) the annual cost of keeping the line in operation for an indefinite period, using the best available techniques with (a) thin-wall and (b) heavy-wall pipe; or (2) the total cost of a line over some selected period of time, from installation through maintenance to eventual removal and salvage, for (a) thin-wall and (b) heavy-wall pipe. Only the first of these two comparisons will here be made, for soils of different corrosive characteristics. In all cases, an 8-in. line will be considered, using wall thickness of 0.322 in. (Schedule 40) and 0.250 (Schedule 20).

Case 1. Nonaggressive soil. — The least corrosive soil reported by Logan[1] in the National Bureau of Standards tests is soil No. 24, Merrimac gravelly sandy loam (No. 6 and No. 31 are here omitted from consideration as being mathematically inconsistent). In this soil an 8-in. line with 0.322-in. wall is reported as averaging one leak per 290,000 ft. in 30 years. Had a wall thickness of 0.250 in. been employed, the expected rate would have been one leak per 69,000 ft. in 30 years, or about four in 290,000 ft. It is obvious that the cost of three average leaks is far less than the cost of 0.072 in. of extra steel on 55 miles of pipe line. If there actually exists a continuous 50-mile stretch of soil this mild anywhere, then neither extra pipe thickness, nor coating, nor cathodic protection could be justified for a pipe line laid therein.

Case 2. Average soil.—Soil No. 5, Dublin clay adobe, is taken as an average or median soil of those in the study cited. The 8-in. 0.322-in. wall pipe shows one leak per 2,000 ft. in 30 years; 0.250-in. wall pipe should expect six leaks in 2,000 ft. in the same period. The 0.072 in. of metal—amounting to some 6 tons in the 2,000-ft. length under consideration—may be credited with having forestalled (or at least delayed) five leaks. The average total cost of five leaks will ordinarily be three or four times as great as the cost of six tons of steel, but when consideration is given to the fact that the steel requires an initial capital investment, whereas the cost of the leaks has been deferred for a number of years, the saving is seen to be more apparent than real. Recalculations based on shorter intervals of time are even less favorable to the advocacy of heavy wall pipe as a means of corrosion control.

Case 3. Corrosion soil.—Soil No. 28, Montezuma clay adobe, is among the most viciously corrosive of those studied. Extrapolation of the data indicates a leak distribution of 100 per foot in 30 years! Such a condition is, of course, impossible, since the assumptions on which the equations are based must include the nondisturbance of pipe and soil; as a matter of fact, upon the occasion of each leak, some few adjacent pits are welded or patched, or a section of line is replaced completely; in either case a portion of the line is given what amounts to a new start. Recalculation indicates a time of 18 years to produce an average of one leak per 10 ft. of pipe.

The actual leak frequency of a line subjected to such maintenance as outlined above could hardly be expected to go beyond an average of one leak per year per 200 ft.; this value would be gradually approached, and, in the soil cited, substantially reached in about 20 years. The same rate would be reached in about 15 years with 0.250-in. wall pipe.

For a true evaluation of the advantages of heavier wall pipe in such soil, however, comparison must be made which include alternate measures of corrosion control—specifically, coating plus cathodic protection. The initial cost of good coating plus an adequate cathodic protection system would not exceed $2,000 per thousand feet of line, and the annual cost thereafter would be less than $100 per thousand feet. To compare with the above figure, we have the ultimate anticipated leak rate of five per thousand feet, and, at a minimum figure of $200 per leak, it is clear that the protection is far cheaper than the leak loss. When it is considered that full protection is equally effective on the thin-wall pipe, it is seen that there is no case for the heavy pipe.

Conclusions

It is recognized that extrapolation to the extent employed in the preceding examples leads to a high degree of uncertainty; it is felt, however, that the results are sufficiently indicative to be useful. It must also be pointed out that uniformly corrosive soils do not normally exist in long stretches, and thus much variation along a pipe line must be expected. All of these considerations seem to add to the strength of the conclusion that all lines intended to be "permanent" should be coated and wrapped throughout—otherwise the application of cathodic protection may be extremely costly, and evey a few short corrosive sections may experience damage exceeding the protection costs on the entire line.

It is felt therefore that any permanent line of any length will be most economically maintained in the long run if the pipe used is of a thickness dictated entirely by operating conditions, with no allowance whatever for corrosion; a layer of steel is a very expensive and a very ineffective protective coating for a pipe line.

References

1. Logan, Kirk H., "Underground Corrosion," National Bureau of Standards Circular C450, November 1945.

Part 7 of a series by Marshall E. Parker, consulting engineer, Houston.

Present Worth of Profits for Constant Percentage Decline

THE calculation of present worth ordinarily requires an estimate by years of receipts and expense. This article presents a simplified method of evaluation for the special case where it is accepted that the "constant-percentage" or "semilog" decline, constant yearly expense, and constant-realization price of oil will apply.

From equations and graphs referring to constant-percentage decline problems presented in previous articles, initial production rate, final production rate, and decline rate fix the period of production and recovery. If operating expense is assumed to be at a constant rate, total operating expense is obtained directly from the period of production. Total net realization may be obtained from the net unit realization and total recovery.

Thus,

$$\text{Total profit} = AB(P_i - P_f) - O \times n \qquad (1)$$

where

- A = net realization, dollars per bbl.
- B = recovery, bbl. per bbl. decline in average daily production
- P_i = initial production rate, bbl. per day
- P_f = final production rate, bbl. per day
- O = yearly operating expense, dollars
- n = period of production in years over which production rate declines at "constant percentage" from P_i to P_f

The sum of the discounted values for yearly production follow a geometrical progression series and the present worth of total profit shown in Equation 1 at an annual discount rate r is stated as follows:

$$\text{Present worth of total profit} = ABP_i \frac{D/100}{(1+r)} \times \frac{1-\left[\frac{100-D}{100(1+r)}\right]^n}{1-\left[\frac{100-D}{100(1+r)}\right]} - \frac{O}{(1+r)} \times \frac{1-[1/(1+r)]^n}{1-[1/(1+r)]} \qquad (2)$$

where

- D = decline rate in per cent per year
- r = discount rate as fraction per year
- n = period in years

In Equation 1, the first part (including the terms ABP_i) represents the present worth of revenue, and the second part (including O) represents the present worth of operating expense. The values of $(1+r)$ raised to a power are shown in interest and annuity tables. The term $[1/(1+r)]^n$ appearing in the first part of Equation 2 is present value readily available from tables. The multiplier of O to obtain present worth is the present value of annuity conveniently obtained from tables. Inspection of Equation 2 will show that the term, $ABP_i \frac{D/100}{1+r}$, represents the discounted revenue for the first period, and the term $\frac{100-D}{100(1+r)}$ represents a common ratio between successive periods.

As shown in Equation 2, the present worth discounted at a rate r compounded annually would refer to the case where it is assumed that profit is received at midyear. For the case where it is assumed that yearly profit is received at an average time corresponding to midyear, it would be necessary to multiply Equation 2 by $(1+r)^{1/2}$.

If it is considered interest is compounded at periods other than yearly, the terms r, D, and O should be expressed in units corresponding to n.

An example of the application of Equation 2 is given as follows:

Problem.—A royalty interest returns an average of 5 bbl. of oil per day having a price of $2.50 per bbl. Decline rate is estimated to be 10 per cent per year, and it is desired to know the present worth of future income over a 10-year period discounted at 5 per cent per year on the assumption that the present price and constant-percentage decline will apply over the 10-year period.

Solution.—In this case, O is zero.

A = $2.50
D = 10 per cent per year

From a chart in a previous article

B = 3,480-bbl. per bbl. decline in daily production
P_i = 5 bbl. per day

From a chart in a previous article

$$\left(\frac{100-D}{100}\right)^n = \frac{P_f}{P_i} = 0.35$$

From present-value tables for 5 per cent per year compounded annually

$1/(1+r) = 0.9524$ (1 year)
$[1/(1+r)]^{10} = 0.6139$ (10 years)

From Equation 2:
Present worth of profit (returnable at end of year)

$$= \$2.50 \times 3{,}480 \times 5 \times 0.10 \times 0.9524 \left(\frac{1-0.35\times 0.6139}{1-0.90\times 95A}\right) = \$23{,}000$$

If it is assumed that revenue is returned at average time of midyear

$$\text{Present worth} = \$23{,}000 \times (0.9524)^{1/2} = \$23{,}600$$

An arithmetical solution of Equation 2 permits a short-cut calculation of present worth in constant-percentage decline problems, but the mathematical solution can be simplified for general use by preparation of tables. Such a short-cut table will be presented in a following issue.

By Rex W. Woods, consulting petroleum engineer, Tulsa

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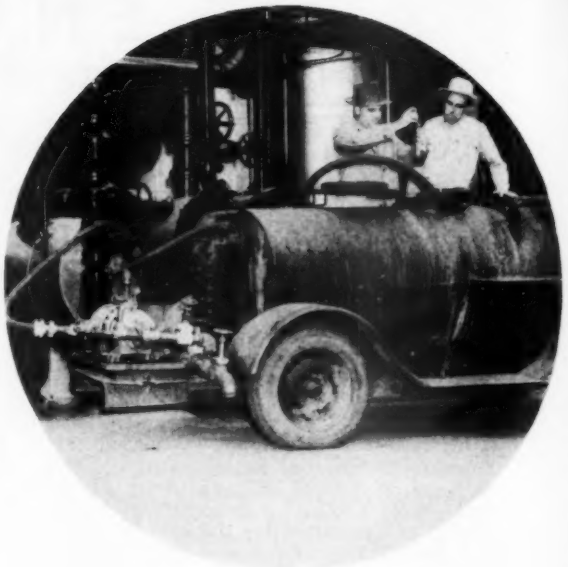

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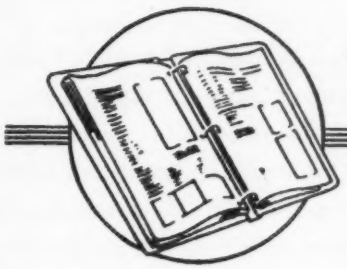

THE REFINER'S notebook

No. 65

Multipurpose Greases*

IN the preceding installment of The Refiner's Notebook, characteristics of some of the older, more specialized greases were considered. Each of these "older" greases usually exhibits some outstanding characteristic such as illustrated in Fig. 1. When selecting a grease for a given application these characteristics are taken into account, as well as the extent to which they may be affected by operating conditions.

The newer, "multipurpose" greases are so called because they combine in a single product the more desirable characteristics normally found in each of several products. Such greases will undoubtedly be improved, and perhaps others will be developed that will bring together an even greater number of desirable qualities.

A brief discussion of two classes of multipurpose greases, according to type of soap used, follows.

Barium soap greases.—Greases containing barium soaps are comparative newcomers in the lubrication field. Their importance has increased rapidly because they combine several of the best characteristics of the older greases. They have high melting points (about 350° F.), and can be successfully used at temperatures 75° to 100° higher than the corresponding older-type sodium soap products. They are smooth to fibrous in texture, and do not soften unduly at temperatures approaching their high melting points. They have been marketed as multipurposes greases for a period long enough to prove their worth in this field.

Lithium soap greases.—Introduced even more recently than the barium products, greases containing lithium soaps give great promise of becoming highly valuable multipurpose lubricants with a very wide range of applications. These greases are buttery to stringy in texture, with high melting points (about 350° F.). Certain special lithium greases (notably those using lithium hydroxystearate, made from hydrogenated castor oil) can be used for long periods at temperatures up to 300° F. without ill effects. These special greases show excellent resistance to water, and also to break down or softening by working. They show no physical change after being heated above their melting points and then cooled. However, the characteristics of lithium greases may vary widely, depending upon their composition—that is, the fatty acid used, the percentage of soap, and kind and viscosity of petroleum oil used, as well as the technique used in manufacture. Some lithium greases may be used at very high temperatures . . and, by contrast, for aircraft lubrication at temperatures as low as —100° F.

Certain special types of lithium soaps give a grease with the greatest mechanical stability of any product so far developed. Such special greases combine the best properties of most of the other greases—highest melting points, excellent water resistance, good "dispensability," small low-temperature torque, and high mechanical stability. These special lithium greases are best known for multipurpose application. Because of their relative newness, the possibilities of lithium greases have not yet been full explored.

In the foregoing paragraphs the term "multipurpose" has been used numerous times. The trend toward these many-purpose products is more fully discussed in a later installment. This is done, first, because of its importance in the over-all picture of lubricating greases, and, second, because numerous other factors that affect grease characteristics as discussed later also have a bearing on these multipurpose lubricants.

*From material prepared by Shell Oil Co. on "Fundamentals of Lubricating Greases."

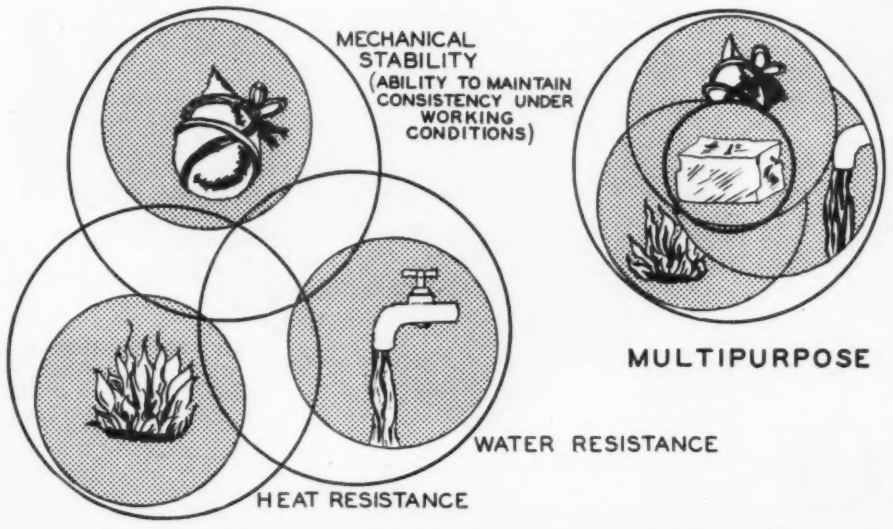

Fig. 1—Illustrating several desirable properties of lubricating greases and combination of these properties in a multipurpose grease.

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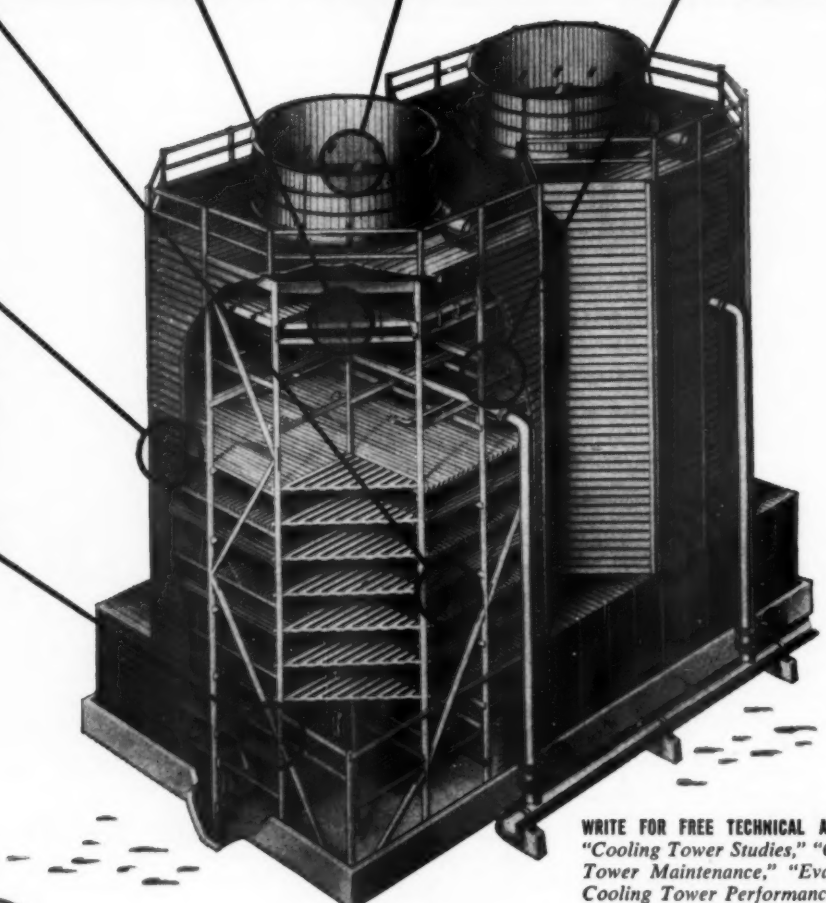

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NATURAL GAS

Capacity Increase

Transco daily deliveries to reach 505,000 M.c.f.

HOUSTON.—Deliveries of gas by Transcontinental Gas Pipe Line Corp. should reach 505,000,000 cu. ft. per day by the middle of May.

Claude A. Williams, president, said that natural-gas requirements of Transcontinental's system are estimated to be 4,200 billion cubic feet over a 20-year period. The company now has under contract 4,300 billion cubic feet of reserves in 54 fields along the Gulf Coast, and no difficulty is expected in obtaining whatever additional gas the company's markets may require in the future.

Regular service on Transcontinental's line from Texas to New York started January 16, and deliveries are being increased gradually from the original 250,000,000 cu. ft. per day rate. The company is presently distributing to customers approximately 64,000,000 cu. ft. per day which will go to New England when the Northeastern Gas Transmission Co. line is completed. An additional 50,000,000 cu. ft. in capacity, principally to deliver more gas to southern states, has been authorized.

1951 construction.—Williams said the company plans to spend about $19,000,000 on construction in 1951. Now on the docket are plans to build an 11-mile lateral across New York Harbor to Brooklyn, and a 27-mile extension of the present line from New Jersey to Connecticut to hook up with Northeastern.

In addition, 45,675 hp. will be installed at present compressor stations on the line from Texas through Central North Carolina. This will raise total station capacity to more than 250,000 hp. and increase deliverability capacity to 555,000,000 cu. ft. per day.

Gas Conversion Planned

NEW YORK.—Consolidated Edison Co., one of the world's largest utility companies, is making plans to convert part of its distribution system to straight natural gas as a result of deliveries received through the recently completed Transcontinental Gas Pipe Line Corp. line from Texas.

Consolidated Edison announced arrangements to convert to straight natural gas its system in Westchester County which adjoins New York City to the north. Louis A. Scofield, vice president, said the 128,000,000 cu. ft. daily, which Consolidated Edison has contracted from Transcontinental, is insufficient to permit conversion of the entire system. A principal reason for selecting Westchester County, he said, is its distance from manufactured-gas plants in New York, along with the fact that the higher B.t.u. value of natural gas nearly doubles the capacity of the company's system.

Consolidated Edison is the largest of five New York utilities taking gas through the Transcontinental line. Some of the other companies now using natural gas for enrichment of their manufactured product are expected to convert later. First, and thus far only, section of New York City to go to straight natural gas is Staten Island, which has been served from a connection with Texas Eastern's system since August 1949.

Well Proration Protested

AUSTIN. — The Texas Railroad Commission will hold public hearings April 12 on a request by Consolidated Gas Utilities Corp. for permission to drill gas wells on less than 160-acre proration units in the eastern Texas Panhandle.

Consolidated said in a letter to the commission that the company was in "dire need" of additional gas to supply its demands for next winter, and wished to express its concern over the rumored 160-acre spacing in Wheeler County.

40 Gas Engines Contracted

MOUNT VERNON, Ohio.—Reynolds Metals Co., Corpus Christi, has awarded contract to Cooper-Bessemer Corp. here to build 40 gas engines of 3,700 hp. each. The 100-ton engines, largest of their type, will operate on natural gas from Texas fields.

The engines will be built in Cooper-Bessemer's Mount Vernon and Grove City, Pa., plants. S. E. Johnson, vice president of the company, said the $12,000,000 contract was the largest single commercial order in the firm's 118 years.

Gas Wells Purchased

GRAND RAPIDS, Mich.—All gas wells and other properties in Orient Stray gas pool, Osceola and Clare counties, Michigan, have been purchased by Michigan Consolidated Gas Co.

Seventeen gas wells, 10 owned by Taggart Brothers Gas Co. and 7 by Sohio Petroleum Co., will go to Michigan Consolidated under terms of the sale. The company plans to produce gas from the pool and make a decision later as to whether the field will be converted to an underground-storage reservoir.

The company now is storing Texas gas in three Michigan reservoirs—Austin field, Mecosta County; Reed City pool, Osceola County; and Goodwell field, Newaygo County. Another pool, Lincoln field in Clair County, will be converted to storage this year.

Eastern Firm Absorbed

WASHINGTON. — The acquiring and operating of natural-gas facilities of Pittsburgh & West Virginia Gas Co., of Pittsburgh, by Equitable Gas Co., also of Pittsburgh, has been authorized by the Federal Power Commission.

Pittsburgh & West Virginia operates wholly within West Virginia, and the bulk of gas which it produces and purchases is sold and delivered at the West Virginia-Pennsylvania state line to Equitable. Principle markets are in Grafton and Shinnston, W. Va.

The facilities involved are interconnected and operated as a part of Equitable Gas System. The companies said that the acquisition will eliminate the necessity of maintaining Pittsburgh as a separate corporation, thus permitting a reduction in operating expenses and the simplification of accounting procedures.

Natural Gasoline

Plants' Output Reported

PITTSBURGH.—Gulf Oil Corp.'s new natural-gasoline plants at Waddell, Tex., and Eunice, N. M., processed almost 27.5 trillion cubic feet of casing-head gas during 1950, and produced 25,075,000 gal. of gasoline.

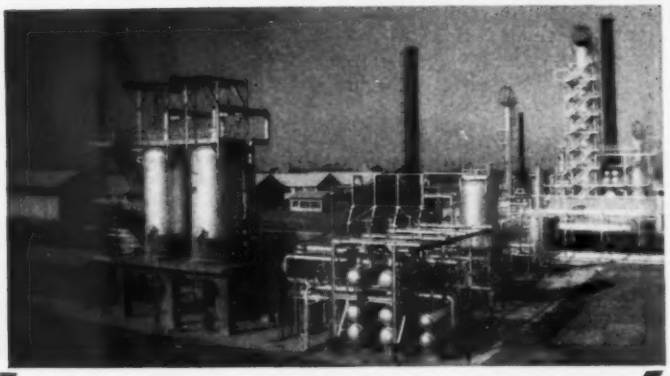
Both installations were placed in operation in the fall of 1949. In addition to natural gasoline, the plants produced 25,310,000 gal. of propane, 11,015,000 gal. of butane, and 16,740,000,000 cu. ft. of residue gas during the year.

Facilities which were recently placed in operation at both Eunice and Waddell will further increase production in 1951. Both plants are of the conventional absorption type and largely automatic. The Eunice plant, larger of the two, obtains its casing-head gas from producing fields in the vicinity. Gas from Waddell, McKnight, Tubb, Sand Hills, Ordovician, Edwards, and Dune fields is processed at the Waddell installation.

In the conversion process, gas is put through a sweetening unit and fed to absorption towers where an absorbent oil recovers natural gasoline, butane, and propane from the gas.

The three intermingled products are then fractionated. Residue gas from absorption towers is also made available as a result of the process.

ANOTHER *Perco** CYCLOVERSION* UNIT



One of the more than 30 Perco Cycloversion units now in full operation is the installation at the new 30,000 barrel per day Petroleos Mexicanos refinery at Salamanca, 150 miles northwest of Mexico, D. F. This 11,600 barrel per day unit went on stream in September, 1950, desulfurizing the straight run gasoline production of this completely modern Mexican refinery.

Write us for complete information on profits in Cycloversion for your own Company. Perco Division, Phillips Petroleum Company, Bartlesville, Oklahoma.

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REFINING

Design Details Released

NEW ORLEANS.—Further operating details of new facilities to be installed at Pan-Am Southern Corp.'s Destrehan refinery near here have been released by the company. Contract for construction of a fluid catalytic cracking unit, alkylation unit, and a hydroformer, plus miscellaneous auxiliaries included in the $6,500,000 expansion program was awarded to Lummus Co. last week. *(The Oil and Gas Journal, March 29, 1951, pages 160 and 350.)*

Added capacity from the new facilities will produce about 7,500 bbl. per day of 100/130 grade aviation gasoline, or 4,000 bbl. per day of 115/145 grade plus 200 bbl. of 100/130 grade. Jet-fuel production will be 5,000 bbl. per day.

Revamping of the crude unit will permit simultaneous processing of 15,000 bbl. per day of light coastal crude to a low percentage of fuel-oil bottoms and 5,000 bbl. per day heavy asphalt crude to asphalt bottoms.

The cracker will process 12,000 bbl. of gas oil per day at high conversion and will operate in blocked operation with a retreating cycle. The vapor-recovery unit will process light ends from the cracker.

Products from the vapor-recovery unit will consist of PP-BB charge stocks. The recovery unit will be designed so that the yield of propylene can be varied from 60 to practically 0 volume per cent.

The alkylation unit will use sulfuric acid as catalyst. Its capacity will be 2,500 bbl. of aviation alkylate per day. Flexibility will be installed to allow for alkylation of mixed propylene butylenes or butylenes alone. Construction of the units will start immediately, and facilities will go on stream in 14 months.

Imports Quotas Announced

WASHINGTON.—The Treasury Department has announced that 4,399,220,700 gal. of crude, topped crude, and fuel oil will be permitted importation this year at the reduced duty provided for in the Venezuelan reciprocal-trade agreement.

Commissioner of Customs Frank Dow reported that the Bureau of Mines had submitted final figures on domestic refinery operations in 1950. Under the Venezuelan agreement the 10½ cents per barrel rate of import tax is extended to imports up to 5 per cent of the continental refinery throughput of the preceding year.

Definite quotas for foreign supplying countries, Dow stated, are 2,613,137,096 gal. for Venezuela, 822,654,271 gal. for the Netherlands and overseas territories, and 963,429,333 gal. for all other countries.

The bureau's statistics showed that up to March 3 imports amounted to 951,542,537 gal. from Venezuela, 706,197,977 gal. from the Netherlands, and 543,549,149 gal. from other countries.

It was learned, however, that imports from the Netherlands West Indies are coming in at a rate which indicates the quota limit is being approached, and instructions have been issued to collectors of customs to begin levying the full 21-cent tax on

NELSON REFINERY-CONSTRUCTION INDEX

Appears in the first issue of each month.
Explanation—Cost-imating No. 61, December 15, 1949, pages 91, 92.
Compiled by W. L. Nelson—Refinery Consultant—Tulsa.
Indexes of Individual Equipment Items—January, April, July, October.

INDEX (1946 = 100)

	1947	1948	1949	Dec. 1950
Centrifugal pumps	109.0	120.0	118.9	136.2
Reciprocating pump	128.5	138.1	144.6	172.3
Compressor	114.0	128.0	120.0	138.1
Engines	109.0	120.0	115.5	137.1
Motors	110.0	112.7	114.0	148.8
Transformers	116.0	116.0	116.0	132.7
Instruments	113.0	120.0	122.0	141.5
Miscellaneous equipment average	114.2	122.1	121.6	143.8
Materials component	122.4	139.3	143.6	161.8
Labor component	113.5	128.0	137.1	147.8
Refinery construction index	117.0	132.5	139.7	153.4

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Paulsboro Plant to Expand

NEW YORK.—Long-range plans of Socony-Vacuum Oil Co., Inc., for a major expansion of its Paulsboro, N. J., refinery were disclosed recently by B. Brewster Jennings, company president, in an interview in Philadelphia.

The program for the refinery provides for an increase in capacity from the present 60,000 to 90,000 bbl. and eventually to 105,000 bbl. daily. These are tentative plans and have not yet advanced to the engineering stage.

Most of the facilities to be added at Paulsboro will be for the increased production of oil fuels, but a portion will go toward enlarging storage facilities. Jennings said the prospective expenditure would be between $12,000,000 and $15,000,000. The Paulsboro refinery has a catalytic cracking capacity of 22,000 bbl. daily and a thermal cracking capacity of 9,200 bbl. daily.

Plant to Begin Processing

PORT ISABEL, Tex.—Processing of crude at the Port Isabel refinery will probably begin in May, and full operation is scheduled for October when the catalytic reforming unit is to be placed on stream, officials of Taylor Refining Co. and Mayfair Minerals, owners, said last week.

The plant will process distillate from McAllen and Rincon fields of the Rio Grande Valley. Continental Pipeline Co. and Frontier Pipeline Co. will deliver crude to the refinery through Continental's line now in operation and a Frontier line being constructed approximately parallel to Continental's line. Pipe for the Frontier line is in Corpus Christi for wrapping.

Benzene Unit Planned

CHICAGO. — Standard Oil Co. of Indiana revealed last week that tentative plans have been made for production of benzene and other aromatics at the Whiting, Ind., refinery. In releasing information on operations of 1950, Dr. Robert E. Wilson, chairman of the board, stated that the company may undertake the operation to help alleviate the current shortage of benzene and its homologs which are an important constituent of aviation gasoline, munitions, synthetic rubber, plastics, detergents, and other materials required in the mobilization effort.

Indiana Standard operates a hydroforming unit at Whiting, with a rated charge capacity of 8,500 bbl. per day.

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PIPE LINES

T.G.T. Projects

Firm plans to lay 794 miles of lines this year

HOUSTON. — A 1951 construction program has been announced by Tennessee Gas Transmission Co. which includes laying 491 miles of 30 and 26-in. line parallel to the firm's existing system at various points in Texas, Louisiana, Mississippi, Tennessee and Kentucky, and extending the system 303 miles to serve New England.

The 491 miles of line includes 467 miles of 30-in. and 24 miles of 26-in. pipe. Seven existing compressor stations are to be enlarged and three complete new stations are to be built in Ohio and New York, making a total of 380,000 hp. for the system.

The program for the year includes the following construction by states:

Texas.—Pipe-line construction—24 miles of 26-in. line from Falfurrias southward, begun in February by Oklahoma Contracting Co.; 30 miles of 30-in. from 13 miles southwest of Victoria to 17 miles northeast of Victoria, begun in February by Oklahoma Contracting Co.; 40 miles of 30-in. from Cypress to Fostoria, to be started this month by Houston Contracting Co.; and 30 miles of 30-in. from Woodville to Jasper, to be started this month by Houston Contracting Co. Compressor-station construction—enlargement of Station 1 at Victoria, including addition of five engines of 2,000 hp. each; Station 2, East Bernard, addition of two 1,600-hp. engines; Station 4, Jasper, addition of two 1,600-hp. engines. All work to begin this month.

Louisiana.—Pipe-line construction—43 miles of 30-in. from Sabine River to near Natchitoches, beginning in April; and 47 miles of 30-in. from near West Monroe to near Mer Rouge, beginning in June, both contracted by Houston Contracting Co. Compressor-station construction—Station 6 near Monroe, addition of four 1,600-hp. engines, starting this month.

Mississippi.—Pipe-line construction—93 miles of 30-in. from near Drew to near Holly Springs, Anderson Brothers Corp. to begin work in May. Compressor-station construction—Station 7 near Greenville, addition of two 1,320-hp. engines, starting in May.

Tennessee.—Pipe-line construction—59 miles of 30-in. from near Parsons to near Dickson, Western Pipeline Constructors, Inc., to begin work in June. Compressor-station construction—Station 10 near Lobelville, supercharging 10 existing engines to add 350 hp. per engine, starting in June.

Kentucky.—Pipe-line construction—125 miles of 30-in., including 67 miles from near Glasgow to near Lebanon, begun in February by Anderson Brothers Corp.; and 58 miles from near Richmond to near Salt Lick, Western Pipeline Constructors, Inc., to begin work this month. Compressor-station construction—Station 200 near Load, addition of four 1,320-hp. engines; Station 110 near Morehead, installation of an advanced-type centrifugal-compressor unit of 5,500 hp. driven by gas turbine, beginning this month.

Ohio. — Compressor - station construction—two new compressor stations to be constructed, beginning this month; Station 204, near Albany, installation of four engines of 1,320 hp. each, and Station 209 near Cambridge, installation of five engines of 1,100 hp. each.

New York.—Pipe-line construction—303 miles of 24-in. from end of main line near Buffalo to New York-Massachusetts state line near Pittsfield, Mass., starting this month. Contracts are split among three companies: 22 miles, Hudson River to New York-Massachusetts state line, Oklahoma Contracting Co.; 125 miles, Syracuse to Hudson River, Bechtel Corp.; 150 miles, Buffalo to Syracuse, H. C. Price Co. Compressor-station construction—Station 229 will be built near Hamburg, and four engines of 100 hp. each will be installed.

Four more submerged river crossings are planned: Sabine River, 30-in.; Tennessee River, 30-in.; Kentucky River, 30-in.; and Hudson River, 24-in.

Big Contract Let

Gulf Southern to lay 1,000 miles of lines

UNITED GAS PIPE LINE CORP. has let a $25,000,000 contract for approximately 1,000 miles of lines to a new organization, Gulf Southern Contractors. This is a joint venture by Texas-Louisiana Contractors, Oklahoma Contracting Co., J. Ray McDermott & Co., Inc., and Morrison-Knudson Co., Inc.

The Gulf Southern organization is headed by Robert Thomas who will establish a project office at Shreveport soon. More than 50 per cent of the undertaking will be handled by the Texas-Louisiana firm. McDermott will have a quarter of the work and Oklahoma Contracting Co. a quarter. The part of the operation assigned to Morrison-Knudson interests will be handled by an organization known as Texas-Louisiana M-K, formed in cooperation with Texas-Louisiana Contractors.

The contracts will cover construction of a network of lines extending from points as far southwest as Agua Dulce, Tex., and as far east as points in Mississippi which will be connected with Texas Eastern Transmission Corp.'s terminus at Kosciusko.

Offshore line.—At the peak of construction there will be 10 or 12 spreads in the field. Work will start about May 1 on a line to extend from an offshore point in Pure Oil Co.'s Block No. 32 on the Louisiana coast to a connection with the United system at Baton Rouge. This job will require four swamp gangs and one main line spread. Pipe will range in diameter from 14 to 30 in. It is now being shipped to yards for storage and coating prior to construction.

Brown & Root, Inc., will handle buying of right-of-way, inspection, and completion of some of the survey work. In addition, this firm will

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FOR DETAILS WRITE

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Fort Madison, Iowa

also complete engineering for the project. The construction of seven compressor stations connected with the projects also will be handled by Brown & Root.

Houston Firm Gets Contract

HOUSTON.—Contract has been let to Williams Brothers-Davis Co. of Houston, for the building of 160-mile section of 30-in. natural-gas pipe line for Texas Eastern Transmission Co.

The section is part of a 900-mile project to Pennsylvania. It will start southwest of Kosciusko, Miss., and run northeast to Florence, Ala.

Contracts are pending for the remaining sections of line to the north. On its southern terminus the line will tie in with United Gas Pipe Line Co.'s system.

Larger Pipe Authorized

WASHINGTON.—Northeastern Gas Transmission Co., of Springfield, Mass., has received authorization to substitute 24 for 20-in. pipe on 144 miles of its endorsed main-transmission line in Massachusetts from the Federal Power Commission. The company also received permission to substitute larger pipe on five lateral lines in that state.

Northeastern testified that the larger capacity would provide service to present customers, meet emergency demands which may arise by reason of emergency interchange of gas between the company and any other firm in New England, and provide service north of Northeastern's present system in Massachusetts, Maine, New Hampshire, and Vermont.

These demands will increase estimated peak-day requirements on the company's system from 207,000,000 to 282,000,000 cu. ft. per day. Additional cost of the 24-in. pipe is estimated at $2,117,000, and the substitution of larger pipe on the laterals will cost an additional $197,000.

FPC O.K.'s Line Extension

WASHINGTON.— Transcontinental Gas Pipe Line Corp., of Houston, has been authorized by the Federal Power Commission to construct a pipe-line extension in New Jersey and to increase the total horsepower of six compressor stations on its system from 61,760 to 67,110.

The newly authorized pipe-line construction includes 8.5 miles of 30-in. line and 8.5 miles of 10¾-in. line from Transcontinental's main transmission line in Bergen County, New Jersey, to the Paterson Gas Works of Public Service Electric & Gas Co. in the Paterson, N. J., area.

Estimated cost of the lateral is $1,785,988. Installation of additional horsepower at the six compressor stations is expected to reduce the total estimated cost.

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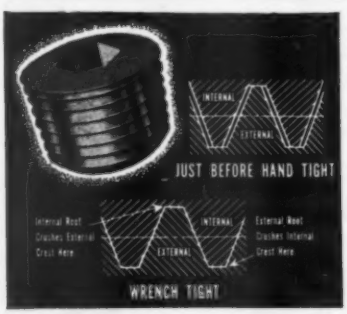

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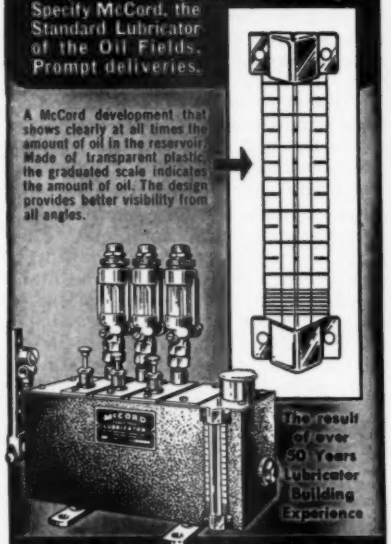

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Pipe-Line Construction

FOLLOWING is a tabulation of pipe-line projects which are planned or under construction. Included are crude-oil, products, and natural-gas lines. The list was compiled from surveys made by The Oil and Gas Journal.

Crude-Oil Pipe Lines

Phillips Pipe Line Co.—35 miles, 10-in.; authorized; Brownfield, Tex., to Plains, Tex.

Phillips Petroleum Co.—278 miles, 10-in., under way, Borger, Tex., to Yale, Okla.; Brown-Lite Co., Tulsa, and Arey-Phillips Construction Co., Pampa, Tex., contractors.

Phillips Pipe Line Co.—53 miles, 8-6-in., under way, Wheeler to Sweeny, Tex.; O. R. Burden Construction Co.

Phillips Pipe Line Co.—24 miles, 8-in., under way, Thrall to Kansas City, Kans.; C. H. Gragg Construction Co.

Platte Pipe Line Co.—1,075 miles, 16-20-in., contracted, Worland, Wyo., to Wood River refining area in Illinois. Contracted as follows: 552 miles, Chatham, Wyo., to Holdredge, Neb., R. H. Fulton & Co., (Sections 1, 2, 3, and 4—section 1, 126 mi., of 16-in.—remainder 20-in.); 142 miles, 20-in., near Marysville, Kans., to Holdredge, Nebr., Bishop & Lock. H. LaQuey, spreadman, (Section 5); to begin May 1951; 100 miles 20-in., northern edge of Kansas, Rumsey Brothers, (Section 6); 274 miles, 20-in., State of Missouri, O. R. Burden, (Sections 7 and 8).

Progress Co.—900 miles, 20-in., proposed, Permian basin, West Texas to California.

Sinclair Pipe Line Co.—700 miles, 22-in., planned; Drumright, Okla., to Chicago.

Texas-New Mexico Pipe Line Co.—75 miles, 8-in., planned, Midland to Germania pool; Midland to Scarborough and Sweetie Peck area; and Crane station to McElroy area, West Texas.

Texas-New Mexico Pipe Line Co.—55 miles, 8-in., planned, Eunice to Covington and Saunders area, New Mexico.

Texas Pipe Line Co.—56 miles, 12¾-in., Chico to Wichita Falls, Tex.; R. H. Fulton & Co., contractor; M. L. Boyd, spreadman, Henrietta, Tex.

West Texas Gulf Pipe Line Co.—450 miles, 26-in., authorized, Colorado City to Wortham, Tex., 26-in.; Wortham to Sour Lake, Tex., 24-in.

West Texas Gulf Pipe Line Co.—18-in., authorized, Wortham to Longview, Tex.

Products Pipe Lines

Buckeye Pipe Line Co.—430 miles, 14-in., proposed, Linden, N. J., to Allentown, Pa., Junction; Chelsea, Pa., via Allentown Junction to Auburn, Rochester, Syracuse and Oswego, N. Y. Start 1952; finish 1953.

Great Lakes Pipe Line Co.—355 miles, 12-in., authorized, Kansas City through Omaha and Sioux City Iowa, to Sioux Falls, S. D.

Great Lakes Pipe Line Co.—119 miles, 8-in.; planned; Des Moines to Iowa City.

Miami-Valley Corps.—58 miles, 8-in., under way, Dayton to Cincinnati, Ohio; Anderson Brothers Co.

Plantation Pipe Line Co.—707 miles, 14 and 18-in., contracted, Baton Rouge to Charlotte, N. C., 275 miles, 14-in., under way, Bremen to Charlotte, N. C.; 432 miles, 18-in., under way, Baton Rouge to Bremen, Ga.; 220 miles, 18-in., Baton Rouge to Mississippi-Alabama state line; Williams Brothers Co. David R. Williams, Jr., project manager, George Allen, spread superintendent, Tuscaloosa, Ala.; T. E. Davis, spread superintendent, Talledega, Ala.

Progress Co.—900 miles, 10-in., proposed, California to West Texas.

Pure Transportation Co.—100 miles, 6-in., under way, Heath to Dayton, Ohio; Wabash Construction Co.

Salt Lake Pipe Line Co.—Proposed, Pasco, Wash., to Puget Sound.

Standard Oil Co. (Ind.).—50 miles, 8-in., under way, north of Sugar Creek, Mo., refinery; Lawhon Construction Co., Southern Mill & Mfg. Co., contractors.

Standard Oil Co. (Ind.).—144 miles, 8-in., authorized, Neodesha, Kans., to Sugar Creek, Mo.

Texas Pipe Line Co.—56 miles, 10 in., under way, Lawrenceville, Ill., to Mt. Vernon, Ind.; O. R. Burden Construction Corp., contractor; O. P. Hines, spreadman; Mt. Carmel, Ill., field office.

Triangle Pipe Line Co.—100 miles, 10-in, planned, Eldorado, Ark., to point on Mississippi River.

Tuscarora Oil Co., Ltd.—27 miles, 8-in., contracted, Pittsburgh Junction, Pa.; to Midland, Pa.; 34 miles, 10-in., contracted, Knappenberger Scraper Trap to Pittsburg Junction, Pa.; 26 miles, 10-in., contracted, Barneytown Scraper Trap to East Freedom, Pa.; Pipe line Construction & Drilling Co.

Natural-Gas Pipe Lines

Algonquin Gas Transmission Co.—276 miles, proposed, Greenwich, Conn., to Boston area; 492 miles, proposed, laterals-New England area.

Amere Gas Utilities Co.—15 miles, 8-in., authorized, KA-8 Flat Top to Beckley, W. Va. Completion date June 1951.

Amere Gas Utilities Co.—11 miles, 8-in., authorized KA-5 loop, Priceton and Athens, W. Va. Completion date December 1951.

Atlantic Gulf Gas Co. (United Gas Pipe Line Co.).—1,530 miles, planned, Alabama-Florida-Georgia-South Carolina.

Carolina Natural Gas Corp.—185 miles, 2-12-in., proposed, lateral lines off Transcontinental in North and South Carolina.

Central Kentucky Natural Gas Co.—12 miles, 20-in., line E loop, Means to Foster, Ky. Completion date October 1951.

Central Kentucky Natural Gas Co.—15 miles, 20-in., Cold Spring, Ky., to Anderson's Ferry, Ohio. Completion date December 1951.

Cities of Booneville and Baldwin, Miss.—96 miles, ¾ and 6-in., under way, Booneville and Baldwin, Miss.; M. L. Hulcher Co., Inc., contractor, Sam Carnahan, spreadman. Completion date November 1, 1951.

Cities Service Gas Co.—40 miles, 4-10 in., Kansas, field office, Liberal; Pat Gilmore, spreadman; Knupp Construction Co., Inc., contractor.

Cities Service Gas Co.—56 miles, planned, Sedgwick, Harvey, and Labette counties, Kansas.

City of Alabama.—84 miles, 2 to 8-in., under way, Alabama; Modern Welding Co., Inc., contractor, D. D. Foreman, spreadman. Completion date October 1951.

Coast Counties Gas & Electric Co.—40 miles, 3, 4, and 8-in., planned, Coast and Valley region, California.

Colorado Interstate Gas Co.—215 miles, 20-in., planned, Texas Panhandle to Colorado.

Commonwealth Natural Gas Corp.—69 miles, 12¾-in., under way, Petersburg, to Norfolk, Va.; Ray L. Smith, contractor.

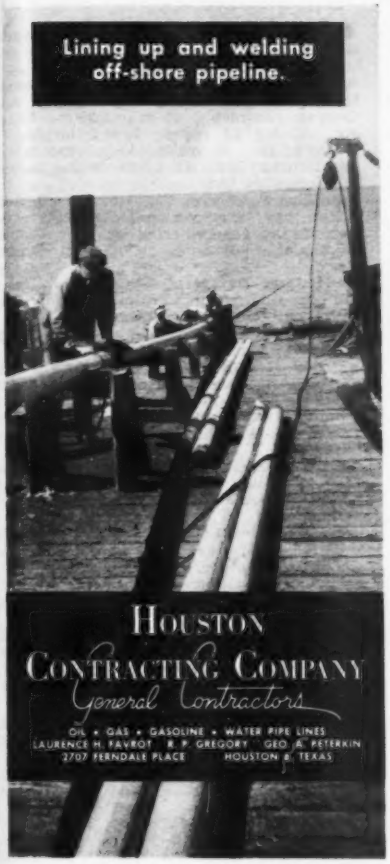
Commonwealth Natural Gas Corp.—14 miles, 8-in., under way, Suffolk to Newport News, Va.; Ray L. Smith, contractor.

Commonwealth Natural Gas Corp.—10 miles, contracted, laterals—Richmond, Suffolk, and Portsmouth, Va.; Ray L. Smith, contractor.

Commonwealth Natural Gas Corp.—99 miles, 18-in., under way, Stanardsville to near Petersburg, Va.; Ray L. Smith & Son, contractor, Don C. Smith, Orange, Va., spreadman.

Commonwealth Natural Gas Corp.—537 miles, 20-in., proposed, West Bend, Ky., to Norfolk, Va.

Consolidated Gas Utilities Corp.—41 miles, 12-in., planned, Enid to Blackwell, Okla., Marlow to Cement, Okla.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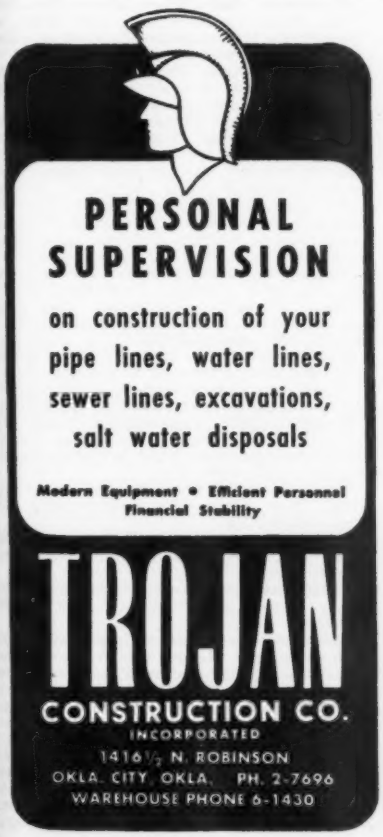

Delhi Oil Co.—68 miles, 8-in., under way, Laredo to Lopeno, Tex. Altgelt Const. Co. contractor, Laredo, Tex., field office, Lee Phillips, spreadman. Completion date 4-1.

East Tennessee Natural Gas Co.—172 miles, 22-in., proposed, Greenbrier to Oak Ridge, Tenn.

Egyptian Natural Gas Co.—80 miles, 6-8-in., authorized, Norris City to Salem-Centralia, Ill., area.

El Paso Natural Gas Co.—122.9 miles, 30-in., proposed, looping along main line in Texas, New Mexico, Arizona.

El Paso Natural Gas Co.—470 miles, 24-in., under way, San Juan basin, New Mexico, to Franconia, Ariz.

Gulf Michigan Transmission Corp.—700 miles, 30-in., proposed, Monroe, La., to Michigan City, Ind.

Hope Natural Gas Co.—32 miles, proposed, Fairmont to Terra Alta, W. Va.

Hugoton Production Co.—40 miles, 20 to 4-in., under way, near Ulysses, Kans., gathering system. Reese Bros. Const. Co., contractor, Hugoton, Kans., field office, Paul G. Reese, spreadman.

Kansas-Nebraska Natural Gas Co.—60 miles, 8-10-12-in., under way, Grand Island to Albion, Neb.; 40 miles, 6-in., under way, Albion to Norfolk, Neb.; 26 miles, 6-in., under way, Albion to Neligh, Neb. Jayhawk Const. Co., Inc., contractor, T. L. Hickerson, spreadman.

Kansas-Nebraska Natural Gas Co., Inc.—22 miles, 12-in., planned, Holcomb to Scott City, Kans.; 12 miles, 12-in., planned, Blakeeney to Palco, Kans.; 34 miles, 12-in., planned, Palco to Phillipsburg, Kans.; 10 miles, 12-in., planned, Alma to Holdredge, Neb. (replacement lines). Neb., 39 miles, 4 and 6-in., planned, Neligh to O'Neill, Neb., 54 miles, 4 and 6-in., planned, Neligh to Hartington, Neb. (extension).

Manufacturers Light & Heat Co.—172 miles, 16-20-24-in., proposed, Clinton County, Pennsylvania, to vicinity of Pittsburgh, Pa.

Manufacturers Light & Heat Co.—50 miles, contracted, near Pittsburgh, Pa.; 75 miles, near Bradford, Pa.; Britton Contracting Co., contractor.

Michigan Consolidated Gas Co.—180 miles, 24-in., planned, Austin, Mich., to Detroit.

Mid-South Gas Co.—40 miles, 12-in. Helena to Forrest City, Ark.; Tulsa Construction Co., contractor; Frank McCoy, spreadman; field office, Marianna, Ark.

Mississippi River Fuel Corp.—40 miles, 18-in., authorized, Dubach to Perryville, La.

National Utilities Co. of Michigan.—76.7 miles, 20-in., proposed, South Central Michigan. (22 miles from near Marshall south to Coldwater; 20 miles east to Hillsdale; 22 miles southwest to Sturgin; 5 miles from Hillsdale to Jonesville and 6 miles west to Union City.)

Nevada Natural Gas Pipe Line Co.—114 miles, proposed, Topock, Ariz., to Las Vegas, Nev.

New River Gas Co.—50 miles, planned, Summers or Monroe counties, W. Va., to Narrows and Dublin, W. Va.

New York State Natural Gas Corp.—39 miles, 20-in., proposed, Potter County, Pennsylvania, to Livingston and Monroe counties, New York.

New York State Natural Gas Corp.—26 miles, 20-in., authorized, New Kensington to South Bend, Pa.

New York State Natural Gas Corp.—51 miles, 20-in., authorized, New Kensington, Pa., to Ohio line.

New York State Natural Gas Corp.—27 miles, 16-in. authorized, looping in Greene and Westmoreland counties.

New York State Natural Gas Corp.—70 miles, 20-in., planned, North Oakford, Pa., to Ohio state line.

New York State Natural Gas Corp.—62 miles, 20-in., under way, Murrysville, Pa., to Petersburg, Ohio; 37 miles, 20-in., under way by May, Boome storage field to Ithaca, N. Y. Field office, Lawrenceville, Pa. Completion date October 1951; 23 miles, 20-in., contracted, state line station to Angelica, N. Y. Office, Wellsville, N. Y. Completion date October 1951: 82½ miles, 20-in., under way by May, Utica to Ithaca, N. Y. Field office, Clinton, N. Y., Leman Creech, supt.; 85 miles, 16-in., under way by September, Utica to Albany, N. Y.;

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Williams-Austin Co., contractor, Ed Peters, over-all general supt.

Niagara Mohawk Power Corp.—40 miles, 10-12-16-in., under way by April 1, lateral lines at Utica, N. Y.; 55 miles, 10-in., Fulton to Watertown, N. Y.; Williams-Austin Co., contractor, Howard Bauer, supt.

Northeastern Gas Transmission Co.—511 miles 20-24-in., authorized, New Hampshire, Massachusetts, and Connecticut.

Northeastern Gas Co.—411 miles, proposed, New England towns.

Northern Natural Gas Co.—580 miles, proposed, Kansas, Texas, Oklahoma, and Nebraska loops.

Northern Natural Gas Co.—370 miles, 4-26-in., authorized, gathering lines in Hugoton field.

Northern Natural Gas Co.—210 miles, 26-in., proposed, five loops in Texas-Oklahoma area, two in Kansas, and two in Nebraska.

Northwest Natural Gas Co.—750 miles, planned, Washington, Oregon, and Idaho.

Ohio Fuel Gas Co.—22 miles, 16-in. authorized, Dayton, Troy, Piqua, and Sidney, Ohio.

Oklahoma Natural Gas Co.—40 miles, 16-in., Velma to Chickasha, Okla.; Trojan Construction Co., contractor.

Oklahoma Natural Gas Co.—53 miles, 26-in., under way, Edmond to Depew, Okla.; Trojan Construction Co., contractor; "Swede" Tillotson, spreadman; Stroud, Okla., field office.

Oklahoma Natural Gas Co.—40 miles, 16-in., planned, Ninnekah, Okla., to County Line, Okla.; Trojan Construction Co., contractor.

Pacific Gas & Electric Co.—47 miles, 8-in., authorized, Salina to Kilig City, Calif.

Pacific Northwest Pipe Line Co. — 400 miles, 22-in., gathering lines on Texas Gulf Coast to Pacific Northwest pipe line.

Pacific Northwest Gas Pipe Line Corp.—2,175 miles, planned, Wharton County, Texas, via Oklahoma, Kansas, Fort Collins, Colo., to Portland, Ore., Tacoma and Seattle, Wash.

Panhandle Eastern Pipe Line Co. — 174 miles, 30 and 26-in., contracted, Tuscola, Ill., eastward—looping present system; R. A. Conyes, contractor. 44 miles, 26-in., Edgerton, Mich.; 22 miles, 30-in., looping in Tuscola, Ill.; 45 miles, 30-in., looping in Montezuma, Ind.; 63 miles, 30-in., looping in Zionsville, Ind.

Phillips Petroleum Co.—118 miles, 3-22-in., under way, Sherman and Hansford counties, Texas gas-gathering system; Vaughn & Taylor Construction Co., Inc., Dumas, Tex.

Piedmont Natural Gas Co.—28 miles, 6-in., proposed, North Carolina—laterals from Transcontinental gas system.

Potomac Gas Co. — 18 miles, 16-in., Dranesville to Arlington, Va.

Prince George's Gas Corp.—20 miles, 22-in., authorized, between Chillum and Rockville, Md.

South Atlantic Pipe Lines, Inc.—254 miles, proposed, Jacksonville area to St. Petersburg, Fla.

South Central Alabama Natural Gas Co., Inc.—150 miles, proposed, central Alabama

South Georgia Natural Gas Co.—248 miles, planned.

Southeastern Michigan Gas Co.—55 miles, 12¾-in.; under way; from point near Clawson, Mich., to Port Huron, Mich.; H. L. Gentry Construction Co., contractor; field office, Utica, Mich.; spreadman, Frank Morris. Completion date 5-1-51.

Southern Natural Gas Co.—120 miles, 16-in.; under way; Mitchell Village, Ala., to Bolingbroke, Ga.; Associated Pipe Line Contractors, Inc., contractor; Columbus, Ga., field office; Lacy Walker, spreadman.

Southern Natural Gas Co.—138 miles, 20-22-in., planned, Chattanooga, Tenn., to Lexington, Miss.

Southern Natural Gas Co.—375 miles, 24-in., planned, Gwinville, Miss., to Atlanta, Ga.

Sunray Oil Corp.—133 miles, 3-30-in., system for Snyder gasoline plant, Vaughn & Taylor Construction Co., contractor. D. D Vaughn, spreadman.

Tennessee Gas Transmission Co. — 992 miles, 30-in., planned, first 150 miles of loops to be laid at Monroe, La., Greenville, Miss., Midland and Portland, Tenn.

Tennessee Gas Transmission Co.—438 miles, planned, looping on Buffalo and New England extensions.

Tennessee Gas Transmission Co. and Northeastern Gas Transmission Co.—175 miles, 24-in., under way, Albany, N. Y., near Wilmington (Boston area), Mass. Oklahoma Contracting Co., contractor, Springfield, Mass., headquarters, Paul R. Halbert, manager, H. A. Wylie, spreadman at Pittsfield, Mass., Aldress Kilgore, spreadman at Westfield, Mass. L. B. Rea, spreadman.

Tennessee Gas Transmission Co.—64 miles, 26 and 30-in., loops, contracted, South Texas. Oklahoma Contracting Co., contractor, field office, Falfurrias, Tex., Panama Shiflett, superintendent.

The Texas Co.—16 miles, 2-6-10-in., under way, gathering system at Davenport, Okla.: C. P. Carter Construction Co., contractor Office Prague, Loyal Bowman, spreadman

Texas Eastern Transmission Corp.—160 miles, 30-in., contracted, extending northeast from Kosciusko, Miss., Williams Brothers-Davis Co., contractor.

Texas Eastern Transmission Corp.—791 miles, 30-in., planned, Koscuisko, Miss., to Connellsville, Pa.

Texas Eastern Transmission Corp.—35 miles, 30-in., contracted, Connellsville to Delmont, Pa.

Texas Gas Transmission Corp.—35 miles, 12-in., authorized, Slaughters, Ky., to Evansville, Ind.

Texas Gas Transmission Corp.—189 miles, 26-in., proposed, Acadia Parish to connection with existing facilities in Morehouse Parish.

Texas Gas Transmission Corp.—195 miles, 26-in., proposed, Gulf Coast region to southwestern Louisiana.

Texas Gas Transmission Corp.—372 miles, 26-in., proposed, looping from Bastrop, La., to Hardinsburg, Ky.

Texas Gas Transmission Corp.—580 miles, 26-in., proposed, Louisiana and Kentucky.

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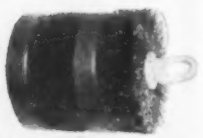
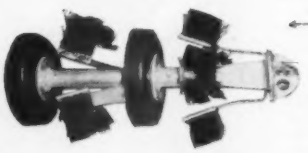
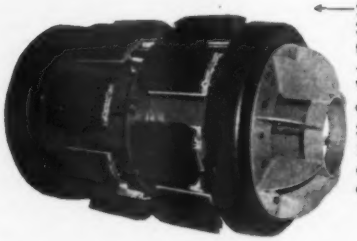


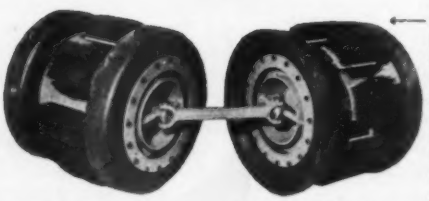
← 4" Size—TYPE JRN—2" to 4" sizes. Will pass 1½R-90° Bends. No valves other than full diameter thru-port valves. Use TYPE SCN-51 for 6" Size.



← 8" Size — TYPE WC-11 — 8" to 14". Will traverse 6 foot radius field bends, full diameter side openings at 45°. SPRINGS COMPENSATE for BRUSH WEAR.



← 20" Size—TYPE GP-2—16" to 30". 200-LB. SPRING Forces the Brushes against pipe wall —COMPENSATING for WEAR. Will traverse round-opening gate or plug valves. SPRINGS and BRUSHES are identical and interchangeable for all types and sizes of GP PIGS.



← 24" Size — GP-3 — 18" to 30" Sizes will pass 1½R-90° Bends. SPRINGS COMPENSATE for BRUSH WEAR, ASSURING Full section cleaning efficiency. GP-3 consists of two Type GP-1 Pigs. — Each Unit may be used as individual pig.

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Texas-Illinois Natural Gas Pipeline Co.—1,300 miles 30-in., under way, Corpus Christi area to Joliet, Ill.

Texas-Illinois Natural Gas Pipeline Co.—100 miles, 30-in., under way, Mississippi River to Effingham, Ill.; Midwestern Constructors, Inc., contractor of Schedule 11 M. T. Wilhite, superintendent; field office, Du Quoin, Ill.

Texas-Illinois Natural Gas Pipeline Co.—117 miles, 30-in., Effingham to Sibley, Ill., Midwestern Constructors, Inc., contractor of Schedule 12.

Texas-Illinois Natural Gas Pipeline Co.—92 miles, 30-in., Sibley to Joliet, Ill.; Midwestern Constructors, Inc., contractor of Schedule 13.

Texas-Illinois Gas Pipe Line Corp.—400 miles, 30-in., contracted, Arkansas and Missouri; Bechtel Corp. A. M. Berlander, general superintendent; field offices at Newport, Ark., J. E. Richardson; Texarkana Ark., V. L. Williams; Popular Bluff, Mo., A. M. Berlander.

Texas-Illinois Gas Pipe Line Corp.—200 miles, 30-in., contracted; Trinity River to Texarkana; H. C. Price, contractor. Work under way.

Transcontinental Gas Pipe Line Corp.—35 miles, 24-in., authorized, Paterson lateral to Greenwich, Conn.

Trunkline Gas Co.—1,775 miles, 10 26-in., under way, includes 740-mile, 26-in. Lake Charles, La., to Tuscola Station of Panhandle Eastern Pipe Line Co., and 1,035 miles, 10-24-in., Lake Charles, La., to McAllen, Tex., completion due October 1, 1952.

Trunkline Gas Co.—50 miles, 26-in., contracted, Longville to northeast vicinity of Hineston, La.; 126 miles, 26-in., contracted Epps to Hineston, La.; 42 miles, 16-20-in., under way, Lake Arthur, Longville to point north of Iowa, La., (Section 1, lateral line); 33 miles, 20-in., under way, Lake Arthur, La., to Lacassine, La.; Houston Contracting Co., contractor.

Trunkline Gas Co.—278 miles, 20-in., contracted, Valley of Texas; R. H. Fulton & Co., contractor.

Trunkline Gas Co.—176 miles, 26-in., under way, Darnell, La., to Longville, La.; Houston Contracting Co., contractor of Section A, main line. E. C. Norris, Olla, La., spreadman. W. H. Hayes, spreadman. De Ridder, La.

Trunkline Gas Co.—180 miles, 26-in., contracted, Darnell, La., to Senatobia, Miss.; Anderson Bros. Corp., contractor, Section B, main line.

Trunkline Gas Co.—184 miles, 26-in., under way, Senatobia, Miss., to Paducah, Ky.; R. H. Fulton & Co., contractor of Section C. main line. Clark Williams, Memphis, Tenn., spreadman.

Trunkline Gas Co.—186 miles, 26-in., contracted, Joppa to Tuscola, Ill.; Mahoney Contracting Co., contractor of Section D main line.

Trunkline Gas Co.—262 miles, 20-in., contracted, McAllen to Altair, Tex.; R. H. Fulton & Co., contractor of Section E and F. lateral lines.

Trunkline Gas Co.—217 miles, 24-in., contracted, Longville, La., to Altair, Tex.; Anderson Bros. Corp., contractor of Sections G and H, lateral line.

United Gas Pipe Line Co.—50 miles, proposed, southeastern Alabama and northwestern Florida.

United Gas Pipe Line Co.—93 miles, 6 to 16-in., authorized, fields in Plaquemines Parish to near New Orleans.

Utah Natural Gas Co.—360 miles, 22-in., proposed, San Juan Basin area to Salt Lake Utah.

United Gas Pipe Line Corp.—55 miles, 20-in., under way, Needville to Freeport; Texas Louisiana Contractors.

United Gas Pipe Line Corp.—510 miles, 24-26-30-in., contracted, Agua Dulce, Tex., to Monroe, La.; 233 miles, 20-24-26-30-in., from Pure Oil Co.'s offshore platform Block 32 Eugene Island area to Jackson, Miss., comp. sta.; 42 miles, 24-in., from Verna comp. sta., Miss., to Baxterville, Miss., dehydration plant; 52 miles, 20-24-26-in., Lirette to Napoleonville, La. to tie into Eugene Island-Jackson, Miss. 30-in. line

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mentioned above; 60 miles, 12-16-20-in., from Lafayette comp. sta. and Weeks Island field to Franklin, La., to connect with above mentioned 30-in.; 59 miles, 30-in., Jackson comp. sta., Miss., to Texas Eastern Trans. Corp. proposed 30-in. line near Kosciusko, Miss.; 124 miles, Sterlington comp. sta. near Monroe, La., to Jackson comp. sta., Miss.; 23 miles, 8-12-16-in., South Louisiana facilities; all contracted by Gulf Southern Contractors, a joint venture including Texas Louisiana Contractors; Oklahoma Contracting Co.; J. Ray McDermott and Morrison-Knudson. Inspection by Brown & Root, Inc.

Valley Gas Pipe Line Co., Inc.—500 miles, 24-in., proposed, Berclair, Goliad County, to northeast Saratoga, Hardin County, Texas, to Vermilion Bay area of Louisiana.

Valley Gas Pipe Line Co., Inc.—1,000 miles, 30-in., proposed, Saratoga northeast to Arcadia, La., to El Dorado and Jonesboro, Ark., Cape Girardeau, Mo., Lawrenceville, Ill., Terre Haute, Ind., and Atlanta, Ind., thence to northeast terminal point in southern Michigan.

Virginia Natural Gas Co.—153 miles, Buckingham to Richmond and Portsmouth, Va.

Westcoast Transmission Co., Ltd.—1,408 miles, 30-in., planned, northern Alberta to Vancouver, B. C., and northern California.

Western Kentucky Gas Co.—2 to 4-in., under way, additions to present system; Modern Welding Co., Inc., contractor.

Western Pipe Lines.—1,200 miles, 22-in., planned, Southern Alberta to Duluth, Minn.

York Gas Co. and Corning Glass Co.—30 miles, York, Pa., and Corning, N. Y.; Britton Contracting.

Foreign Crude-Oil Pipe Lines—Planned and Under Way

Alberta Pacific Oil Pipe Line Co. (Brokaw, Dixon, McKee).—970 miles, 16-.in. proposed, Edmonton south to Kingsgate, B. C., to Washington to Vancouver, B. C.

Basrah Petroleum Co.—72 miles, 12-16-in., under way, Zubair to Fao, Iraq.

Cia. de Petroleo Ganso Azul, Ltd.—48 miles, 4-in., planned, Ganso Azul field to Pucalpa on upper Ucayali River, Peru.

Condor S.P.A. (Shell).—80 miles, planned, Genoa to Rho, near Milan, Italy.

Direccion General de Yacimientos Petrolliferos Fiscales.—409 miles, under way, Plaza Huincul to Bahia Blanca, Argentina.

Iraq Petroleum Co., Ltd.—556 miles, 30-32-in., under way, Kirkuk, Iraq, to Banias, Syria, 1952; Bechtel-Kirkuk, contractor.

Middle East Pipelines, Ltd.—800 miles, 34-36-in., planned, Iran to a Levantine port.

Montreal Pipe Line Co., Ltd.—68 miles, 18-in., under way, near Highwater, Que., to Montreal East; Fred Mannix & Co., B. V. Elliott, superintendent, Cowansville, Que. (Section 3).

Petroleos Mexicanos.—145 miles, 12-in., considered, 18 de Marzo field via Reynosa to Monterrey, Mexico.

Shell Caribbean Petroleum Co.—11 miles, 16-in., authorized; Bachaquero (north) to Lagunillas, Venezuela, 5-51.

Shell Caribbean Petroleum Co.—165 miles 30-in., under way; Palmarejo to terminals on the Paraguana Peninsula (Cardon and Las Piedras, Venezuela), 12-51. Land sections contracted by Williams Brothers, de Venezuela, S. A., Charles P. Williams, manager, Marvin E. Jones, superintendent. Water crossings contracted by Mahoney Contracting Co.

Shell Caribbean Petroleum Co.—18 miles, 4-in., under way, Mara to Palamarejo.

Shell Caribbean Petroleum Co.—16 miles, 14-in., under way, Tia Juana to Cabimas (hot oil).

Trans-Mountain Oil Pipe Line Co.—715 miles, proposed, Edmonton, Alta., to Vancouver, B. C. Canadian Bechtel, Ltd., contractor. Completion date 1952.

Winnipeg Pipe Line Co., Ltd.—75 miles, 10-in., under way, Gretna to Winnipeg, Manitoba; Sparling-Fowler Co., Ltd.

Foreign Products Pipe Lines—Planned and Under Way

Cia. des Pipe Lines Petroliers Francias.—150 miles, 10-in., planned, Le Havre to Paris, France.

Colombia Ministry of Petroleum.—90 miles, 6-in., planned, Puerto Berrio to La Dorada, Colombia.

Colombia Ministry of Petroleum.—163 miles, 4-in., planned, Puerto Berrio to Medellin, Colombia.

Colombian Ministry of Petroleum.—75 miles, 4-in., planned, Buena Ventura to Cali, Colombia.

Estrada de Ferro Santos Jundial.—32 miles, 10-in., under way, Santos to Sao Paulo, Brazil; Techint, contractor.

Estrada de Ferro Santos a Jundial.—32 miles, 18-in., under way, Santos to Sao Paulo, Brazil (fuel oil line); Techint, contractor.

Governments of Southern Rhodesia and Portuguese East Africa.—200 miles, considered, Beria, Portuguese Mozambique to Umtali, Southern Rhodesia.

Petrocongo (Sub. Cie. Financiere Belge des Petroles, S. A.).—225 miles, considered, Ango-Ango to Leopoldville, Belgian Congo.

Petroleos Mexicanos.—155 miles, 10-in., under way, Minatitlan to Salina Cruz, Mexico.

State of Cundinamarca, Colombia.—120 miles, 6-in., Puerto Salgar, to Bogota, Colombia; Williams Brothers Corp., David Louthen, manager, Bogota.

Trans-Northern Pipe Line Co.—400 miles, proposed, Hamilton, Ont., to Toronto, Ont., to Montreal, Que., Canada.

Foreign Natural-Gas Pipe Lines—Planned and Under Way

Direccion General del Gas del Estado.—310 miles, 8-in., under way, Plaza Huincul to Neuquen, Argentina, to the vicinity of General Conesa, Argentina.

Northwest Natural Gas Co.—950 miles, 24-in., planned, Alberta fields to Vancouver, B. C., Seattle, Wash., and Portland, Ore.

Northwestern Utilities, Ltd.—35 miles, 16-in., authorized, Viking to Shonts.

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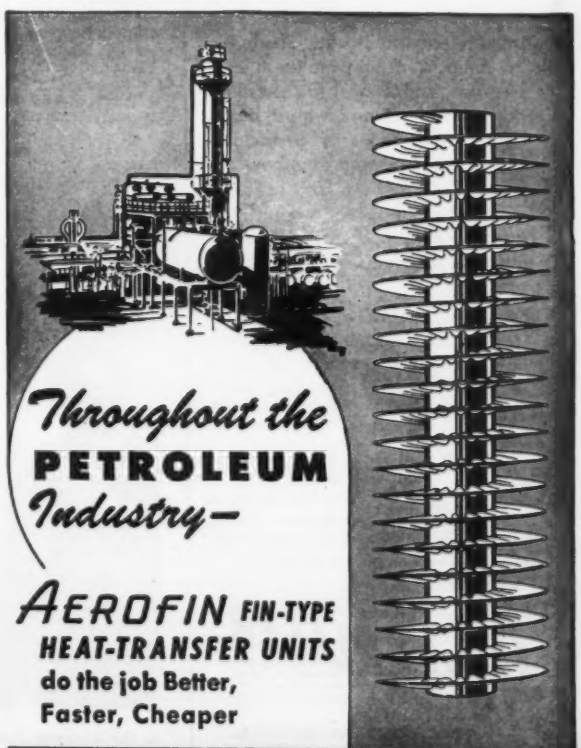

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Among the Drilling Contractors

Number of Active Rigs Nears Peak This Year

Active rotary rigs in the United States and western Canada during the week ended March 26 totaled 2,351, the greatest number since the first of the year. The number represented an increase of 73 over the total for the previous week, and a gain of 197 since the latter part of February when the present upturn in drilling activity began. During the latter part of February the number of active rigs had dropped to a low for the year so far of 2,154.

Increases during the week were general in all areas except western Canada, where a decline of 11 active rigs was reported. Greatest gain was in the West Texas-New Mexico area. Active rigs in the United States totaled 2,251, a gain of 84. The number for the entire region was 316 greater than for the corresponding week a year ago.

ROTARY RIGS IN OPERATION*

(United States and Western Canada)

Area—	Week ended 3-26-51	Change week ended 3-19-51	Change week ended 3-27-50
Gulf Coast	531	+17	+ 24
W. Tex.-N. M.	825	+28	+125
Ark.-N. La.-E. Tex.	149	+ 8	+ 33
Oklahoma	301	+13	+ 52
Kansas-S. Nebraska	153	+ 5	+ 33
Illinois-Eastern	44	+ 5	— 39
Rocky Mountains	108	+ 2	+ 41
Pacific Coast	140	+ 6	+ 5
Total United States	2,251	+84	+274
Western Canada	100	—11	+ 42
Total	2,351	+73	+316

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States as a whole and the West Texas-New Mexico and Kansas-Oklahoma areas are shown by charts on pages 148 and 149.

Stansbury Rigs Busy

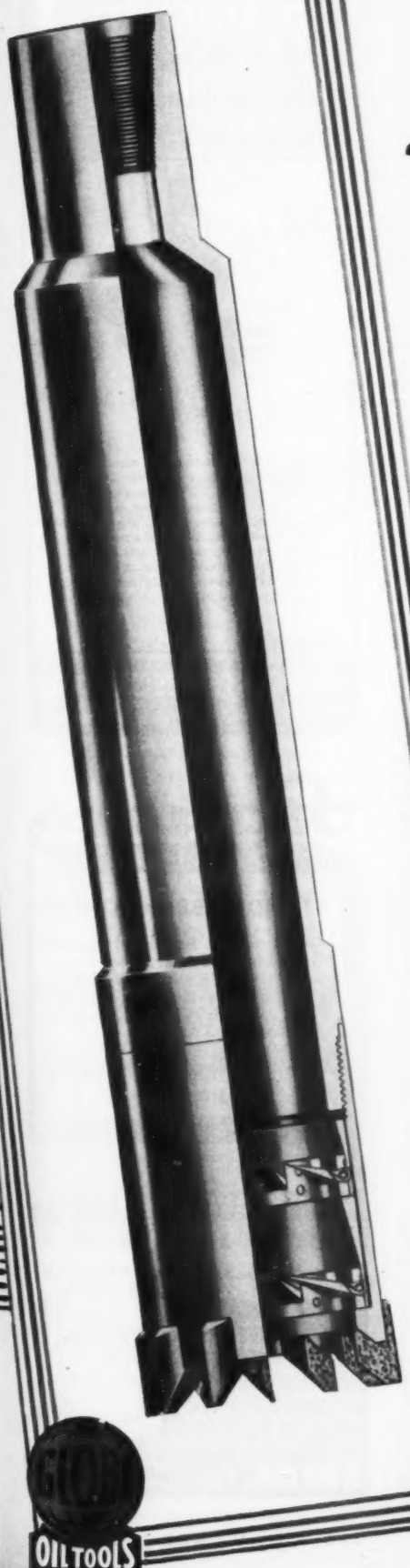
Stansbury, Inc., Bakersfield, Calif., is one of the busiest drilling contracting firms on the Pacific Coast. M. H. Stansbury, one of the owners, reports the firm has drilled 93 wells in the Cuyama Valley fields alone, and that within the past year, running three rigs, it has completed or started 49 wells with a total footage of 185,022 ft.

C-G Drilling Co., Wichita, is the contractor on a wildcat test which M & L Oil Co. is drilling 1½ miles northwest of the Burnett pool, in Rooks County, Kansas. Location is on the Weisner lease in the SW SW NE 26-10-18.

El Dorado Drilling Co., El Dorado, Ark., is starting a 5,000-ft. test 3½ miles southwest of Sunnyside, Chicot County, Arkansas. The test is being drilled for Jack Marvin and E. L. Van Dyke. Location is in NE NW NW 3-17s-1w.

Barbour Drilling Co., Tulsa, has the contract for Schermerhorn Oil Corp.'s second test for the area, in Logan County, Oklahoma, where production recently was opened in Layton sand. The new test, 1 Thompson, NE NW

In the Lindsay Townsite pool, Garvin County, Oklahoma, where Rollin Drilling Co., Oklahoma City, is contracting for Max Pray and associates. Left to right: M. B. Winsett, crewman, and Ted Griffin, driller, for the contractor; John R. Warden, Bovaird Supply Co.; C. H. Cavener, Longhorn Supply Co.; C. W. Bramum, crewman, and "Bill" Bramum, toolpusher, for the contractor.



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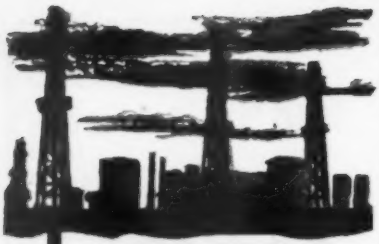

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SW 4-19n-4w, is ¼ mile east of the discovery well, 1 Bridal. Contract is for 6,500 ft. to test the Wilcox sand, in which the discovery well had showings but failed to produce commercially. Layton production in the discovery well is from casing perforations at 4,744-66 ft.

Fleet Drilling Co., Ada, Okla., and Dallas, has moved a rotary rig to a wildcat location 4 miles west of Newkirk, in Kay County, Oklahoma, where it will drill a 3,750-ft. test for Mazda Oil Corp. The test is 1 Tarpening. Location is in the SE SE NE 30-28n-2e.

Falcon Seaboard Drilling Co., Tulsa, has a string of tools on a rank wildcat in northeastern Beaver County, in the Oklahoma Panhandle. Falcon Seaboard has a 25 per cent interest in the project with Sunray Oil Corp. Location of the test is the C NW NE 13-6n-27e CM, on the Hennigh lease, northwest of Gage. Hole is projected to 6,500 ft.

Claud M. Bagley, Shreveport, is the contractor on a wildcat test which Ray McClain of El Dorado, Ark., is starting 2½ miles northwest of the Aurelle townsite, Union County, Arkansas. Location is in the NE SE NE 22-19s-1w. Contract is for 3,600 ft.

Tilley Drilling Co., Wewoka, Okla., is making hole on a 2,600-ft. Cromwell sand test located northeast of the Southeast Tiger Flats pool, in the NE NE NE 12-12n-12e, southwestern Okmulgee County, Oklahoma. The well, 1 Martin, is being drilled under contract for Bern F. Nellis and associates.

T. W. Drilling Co., Inc., Long Beach, Calif., has contracted with W. J. Carter of the same city for a wildcat test to be drilled near Mecca, in the Imperial Valley, San Diego County, California. Location is for 1 Carter-Hazelton, in 25-10s-7e.

Claud M. Bagley, Shreveport, has moved a light rig to a wildcat location 3 miles south of Blevens, in Hempstead County, southern Arkansas, where he will drill for N. V. Kinsey. The test is 1 Miller, in the SE SE 33-10s-24w. Contract is for 2,100 ft.

Howell & Howell tools are being used on a 3,500-ft. test which B. B. Blair, Tulsa, is drilling in the area 1½ miles west of Sumner, Noble County, Oklahoma. Location is a mile south of the Otoe City pool at 1 Johnson, SE SE NW 25-22n-1e.

Justiss - Mears Drilling Co., Jena, La., has taken a contract for a 4,500-ft. Wilcox sand test to be drilled for J. S. Michael Co. at 2-A Nebo, in the C SE NE 9-8n-2e, 2 miles south of the Little Creek field, LaSalle Parish, Louisiana.

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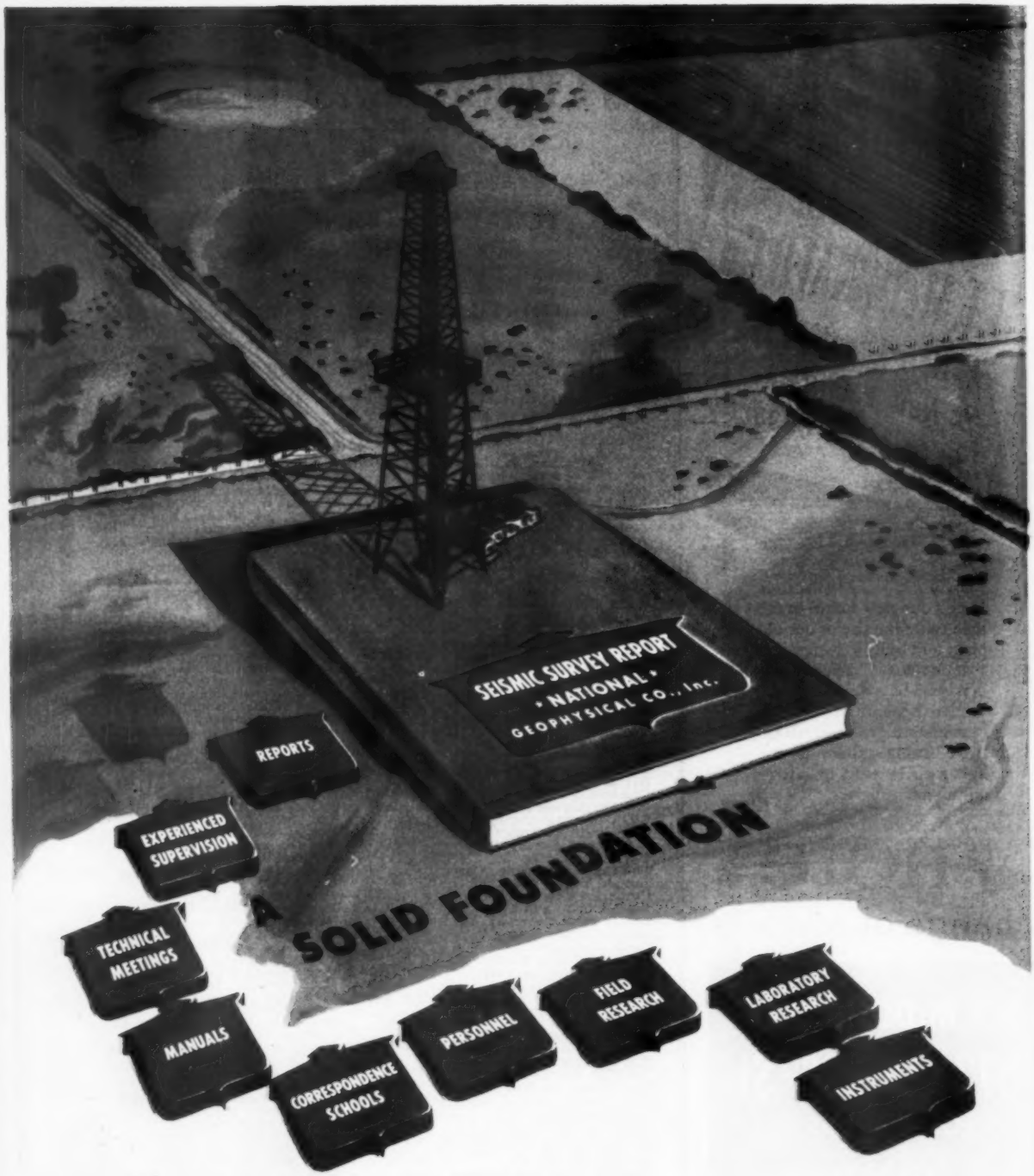

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Eager Beaver Creek

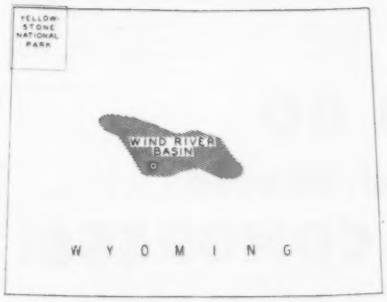
HERALDED as one of the most promising undeveloped oil-bearing structures in the Rocky Mountain region is Beaver Creek in Fremont County, Wyoming.

This Wind River basin oil and gas field was discovered in 1938 when Stanolind Oil & Gas Co. completed a wet-gas well in the Lakota sand. The well was shut in until 1944 when development drilling of Beaver Creek was initiated. The field now has eight additional wells producing wet gas from the Cretaceous in five Frontier sands, the Muddy, and the Lakota. In 1948 a deep test of the structure found 45°-gravity oil in a 260-ft. section of Pennsylvanian - Tensleep topped at a depth of 10,442 ft. to indicate the probability that an enormous oil reserve lay beneath the developing wet-gas reservoirs. Now comes a report that a Tensleep-bound hole has flowed oil from the Cretaceous-Mesaverde formation to indicate the addition of yet another productive zone.

Stanolind 14 Tensleep unit, NE NW SW 10-33n-96w, tested the Mesaverde between 3,655-4,035 ft. for 1 hour. There was gas at the surface in 3 minutes and oil in 46 minutes. The well flowed 37°-gravity oil at the rate of about 40 bbl. per hour with considerable gas for 14 minutes. Though this is the first well at Beaver Creek to find oil in the Mesaverde, two other wells have shown some gas and the zone has been recognized as probably carrying oil or gas from electric logs of other wells in the field. Stanolind plans to dig on to the Tensleep in this well and to move in a smaller rig to check the Mesaverde's ability to produce oil.

In addition to the proven productive zones, Stanolind's geologists believe that formations below the Tensleep eventually may prove to be profitable objectives at Beaver Creek. No holes in this field have been drilled to the Mississippian-Madison where exeellent porosity, such as found at Big Sand Draw about 10 miles to the southeast, can be expected. Also considered as possible oil bearers are the Darwin sand at the base of the Amsden and the Cambrian, productive at Wertz and Lost Soldier, respectively, some 30 miles to the southeast.

The proven productive closure at



Beaver Creek is about 1,200 ft. with the total closure of the structure yet to be established. The axis of the Beaver Creek anticline trends north-south in the surface Wind River beds but with depth the structural axis changes to northwest-southeast to roughly parallel the southern "edge" of the Wind River basin. Geological data accumulated to date indicate that Beaver Creek and Riverton Dome, a 1949 Tensleep discovery which is located about 10 miles to the northwest, are on the same structural axis.

The Wind River basin is a major asymmetrical syncline with the steep limb to the north. All of the production so far developed in this basin has been at anticlines bordering the basin or a short distance within the basin. These pools yield oil from the Cretaceous, Jurassic, Triassic, Permian, Pennsylvanian, and Mississippian with the Permian-Phosphoria and the Tensleep accounting for most of the fields. Only West Poison Spider, located at the eastern end of the basin, is producing oil from the Mesaverde within the Wind River basin province. The only other field in Wyoming that is producing oil from this formation is Simpson Ridge about 60 miles to the southeast of Beaver Creek in the Laramie basin. Golden Eagle, 35 miles north of Beaver Creek in the Big Horn basin, at one time produced a little gas from the Mesaverde.

Philip C. Ingalls

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—Kewanee Oil Co. 1 Oliver, 11-1-H&GN, 1½ miles north of Salt Creek reef field in Kent County, was reported 90 ft. high on the reef to the nearest producer. Top of the reef was 6,380 ft., or minus 4,251 ft. and samples had good to fair porosity and oil stains. The well may have 165-175 ft. of pay above the water table, according to field sources. A caving hole had delayed drill-stem tests.

WEST CENTRAL TEXAS.—New Ellenburger production east of the Permian Basin has been assured at Stanolind's 1 Glass, Fisher County test just east of the Pyron townsite near the Scurry County line. Drill-stem test from 7,279-7,327 ft., total depth, flowed 37 bbl. of oil in 1 hour. Recovery was reversed out and electrical surveys were being run.

TEXAS GULF COAST.—Big Hill field, Jefferson County, has been extended 1¼ miles to the north at The Texas Co. 1 Fannie Davis Crow, which flowed 130 bbl. of 37.6°-gravity oil daily from the Miocene at 3,602-13 ft. Sinclair Oil & Gas Co. 1 Bess Henry, wildcat 10 miles northeast of Chapel Hill, Washington County, recovered 1,100 ft. of 44°-gravity oil on 15-minute drill-stem test at 9,233-41 ft. The first Jackson sand discovery in Weesatche field, Goliad County, has been completed at Atlantic Refining Co. 1 Jean McCampbell Davis, which pumped 69 bbl. of 32.2°-gravity oil daily through perforations at 3,852-60 ft.

ROCKY MOUNTAIN AREA.—Orin Tucker's Little Beaver Creek wildcat, Adams County, flowed on partial test of the Muddy sand. British-American Oil Producing Co.'s Graylin wildcat, Logan County, made oil on tests of two sands, and is coring ahead. Stanolind Oil & Gas Co. reversed oil on tests of the Mesaverde in Beaver Creek field, Wyoming, for a possible important additional reserve in this area.

Mississippi

Good Oil Shows Found by Wilkinson County Wildcat

JACKSON.—Good oil shows have been encountered at John Brooks - Petersen Drilling Co. 1 Louis Wax, wildcat, 36-3n-3w, Wilkinson County, Mississippi. Operators attempted 60 side-wall samples from 5,721 to 8,459 ft. and recovered 54, with recovery being shale and sandy shale with shows at 7,299, 7,300, 7,301, 7,302 and 7,303 ft. A drill-stem test was attempted with dual packers set at 7,271-7,304 ft., using ¼-in. top and bottom chokes. Tool was open ½ minute with an excellent blow when top packer failed. No further attempts were made to run a test and operators are preparing to run pipe prior to any additional tests. Electric log indicated a sand at 7,368-81 ft. which showed a "kick." Side-wall cores were attempted, but the hard sand recovered no show. However, operators plan to land casing below this sand so that an adequate test can be made.

Smackover sand has been reached at 13,717 ft. at Continental Oil Co. 1 Cameron, 36-10n-1e, Madison County. Top of Buckner section was 13,620-30 ft. Coring was commenced at 13,683 ft. and continued to total depth of 13,732 ft. with no shows.

Sinclair Oil & Gas Co. is running completion test at 1 R. T. Liddell, et al, gas-condensate discovery, 67-9n-1e, Jefferson County. On latest test, the well flowed 2,600,000 cu. ft. of gas per day plus 254 bbl. of 57.8°-gravity condensate. Production was through 54 jet perforations at 10,072-81 ft. Tubing pressure was 3,090 psi. and casing pressure 3,260 psi.

George Vasen 1 Tung Oil Corp., 9-2s-11w, Stone County, is at total depth of 20,352 ft., shut down, and waiting on casing.

Smith County Oil Co. has cored additional sands in the Eutaw formation at its wildcat, 1 Mrs. M. J. Sanders, et al, 32-10n-10w, Jones County. Latest shows were recovered in cores cut between 5,620-70 ft. Through this section an estimated 5½ ft. of new pay sands were recovered. Sands were in thin stringers ranging from 1 in. to 2 ft. in thickness. At last report, operator was drilling at 6,358 ft.

MISSISSIPPI WILDCAT FAILURE

Walthall County: B. E. Davis-D. J. Madden 1 Harrison Ball, 22-1n-11e, dry, TD 10,568 ft.

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Texas Gulf Coast

Big Hill Field Gets North Flank Extension

HOUSTON.—Production has been extended 1¼ miles on the north flank of Big Hill field, Jefferson County, at The Texas Co. 1 Fannie Davis Crow, Seth Davis Survey 172. On potential test, the well flowed 130 bbl. of 37.6°-gravity crude from the Miocene at 3,602-13 ft. through 9/64-in. choke. Tubing pressure was 475 psi. Hole is bottomed at 4,593 ft. and has 7-in. casing cemented at 3,615 ft.

Sinclair Oil & Gas Co. has confirmed oil recovery on a drill-stem test at 1 Bess Henry, wildcat test 10 miles northeast of Chapel Hill in Washington County. On 15-minute drill-stem test at 9,233-41 ft., using 1,000-ft. water cushion and ¼-in. bottom and ⅛-in. top chokes, the well had good blow at once, and recovery was 1,100 ft. of 44°-gravity oil. No water was encountered on the test. At last report, operator was coring at 9,411 ft. This prospective field opener is located in William Gates Survey, Abstract 46.

New gas production has been opened 10 miles northwest of Louise in Wharton County at Republic Natural Gas Co. and Chas. H. Osmond 2 Beck-Rasmussen. The well was gaged for 5,400,000 cu. ft. of gas per day on open-flow test. Shut-in pressure was 1,098 psi. Hole is bottomed at 3,222 ft. and production is through perforations at 2,598-2,605 ft. Location spots in J. Mitchell Survey, Abstract 651.

Potential gage has been run on Atlantic Refining Co. 1 Jean McCampbell Davis, Jackson sand discovery in Weesatche field, Goliad County. The well was completed on pump for 69 bbl. of 32.2°-gravity oil per day through perforations at 3,852-60 ft. Operator drilled the well to a total depth of 8,001 ft. but failed to find production in the Wilcox and plugged back to 4,571 ft. Sand with oil shows had been logged at 4,699-4,701 ft. in the Yegua zone, and again at 4,716-17½ ft., but this was insufficient to make commercial production. The well is located in J. Simmons Survey, Abstract 253.

Harold Link and associates are reported to have established new gas production at 1 Schueneman, wildcat test in H&TC RR Co. Survey, Section 18, Abstract 644, Fort Bend County. Through perforations at 4,626-37 ft., the well flowed an ungaged amount of gas with 1,600 psi. flowing pressure. The well is now shut in waiting on open-flow test.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Calhoun County: Gas-condensate discovery—Fullerton Oil Co. and Ryan Consolidated Oil Corp. 1 T. A. McDonald, Miguel Castillo League, TD 9,740 ft., perf. 9,654-84 ft., IP: 164,820 cu. ft. of gas per day plus 12 bbl. condensate, 13/64-in. choke, 53° gravity.

Goliad County: New pay at Weesatche—Atlantic Refining Co. 1 Jean McCampbell Davis, J. Simmons Sur., A-253, TD 8,001 ft., perf. Jackson 3,852-60 ft., IP: 69 bbl. oil per day on pump, 32.2° gravity.

Jasper County: Oil discovery — American Republics and Houston Oil Co. 1 Hughes, et al, Henry Webb Sur., A-42, TD 8,103

ft., 6,922-94 ft., IP: 64 bbl. oil per day, 7/64-in. choke, TP 675 psi., 40.5° gravity.

Victoria County: Gas discovery—The Chicago Corp. B-9 J. A. McFaddin Estate, J. W. Moore Sur., A-479, TD 6,500 ft., perf. tubing 3,400-10 ft., perf. casing 2,929-36 ft., no gage, shut in.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Austin County: Northern Ord., Inc., 1 Boecker, John Hodge Sur., A-49, dry, TD 6,029 ft.

Brazoria County: Adams & Haggarty 1 Lansaster, et al, M. V. O'Donnell Sur., A-469, dry, TD 8,015 ft.

Humble Oil & Refining Co. 1 Bingham, et al, John Howell Sur., A1210, dry, TD 10,900 ft.

Chambers County: William Herbert Hunt Estate 1 Juul, et al, H&TC Sur. 108, A-567, dry, TD 9,800 ft.

Karnes County: John E. Dixon 1 Schorre, Victor Blanco Sur., A-3, dry, TD 4,035 ft.

Kirkwood & Co., et al, 1 W. Nichols, Carlos Martinez Grant, 5 mi. SE of Green, dry, TD 7,515 ft.

Liberty County: The Texas Co. 1 Zalesky, E. P. & R. H. Miller Sur., A-734, dry, TD 4,268 ft.

Live Oak County: Lion Oil Co. 9 McNeill Ranch, GH&HRR Sur., A-199, dry, TD 6,119 ft.

Newton County: Houston Oil Co. and American Republics Corp. 1 Kurth, Jr., et al, F. Stover 4 Sur., A-497, dry, TD 7,532 ft.

Orange County: Union Producing Co. 1 Stark, I&GN Sur., A-233, dry, TD 8,707 ft.

Refugio County: Sam E. Wilson, Jr., 3 Jamie Hynes, M. Arocha Sur., A-79, dry, TD 6,730 ft.

Victoria County: J. S. Abercrombie 1 Corine M. Wood, T&NO RR Sur., A-363, dry, TD 6,627 ft.

Wharton County: Geochemical Exploration Co. 1 Arthur Thomas, I. RR. Co. Sur., A-259, dry, TD 5,850 ft.

Rocky Mountain

Denver-Julesburg Basin Extension Indicated

DENVER.—Possibility of moving production farther south in the current Denver-Julesburg basin play is indicated in testing at the Orin Tucker et al 1 Hough, NW NE NE 1-2s-57w, wildcat in the Little Beaver Creek area, Adams County, Colorado. This well flowed by heads after perforating casing between 5,191-97 ft., and the operator is now running tubing for further tests. Production is from the Muddy sand topped at 5,262 ft. The operator acidized the zone with 500 gal. after swabbing the well dry initially. Tucker and others are now drilling four wildcats through the basin of Colorado.

British-American Oil Producing Co. also has an apparent discovery, 3 miles south of Mount Hope pool, Logan County. The well is 1 Monroe, NE NE SW 7-8n-53w, in the Graylin area. The well made 2,630 ft. of oil on test of the D (First Dakota) sand and 500 ft. of oil from the J (second sand) topped at 4,990 ft. The well found water in a third sand and is now coring ahead for the Lakota. Oil is produced from both the D and J sands at Mount Hope and British-American's Yenter pool, northwest of Graylin.

A surprise development in Beaver Creek field, Fremont County, Wyoming, may indicate further substantial oil reserves for this area. The field was discovered in 1938 with gas in the Dakota sands at around 8,000 ft., but there was no further development until 1946. In 1948 Stanolind Oil & Gas Co., operator of the 17,166-acre unit, made an oil discovery in Tensleep below 10,000 ft. This week Well 14 Tp Unit, NE NW SW 10-33n-96w, flowed at the rate of 66 bbl. of oil per hour on drill-stem test of a zone in Mesaverde between 3,655-4,035 ft. The oil is 37° gravity, paraffin base. Shows had been found in this zone in pervious wells, and two wells had a small amount of gas on test. However, it is not believed that there were previous adequate tests of the zone. Mesaverde produces in only two other fields in Wyoming. At West Poison Spider, on the east side of the Wind River basin, there is one Mesaverde oil well producing at 9,000 ft., and Pure Oil Co., operator of the field, is now preparing to deepen this well to the Dakota-Lakota series at around 16,000 ft.

Carter Oil Co. and Stanolind Oil & Gas Co. are now running 7-in. casing to 12,518 ft., total depth, at 1 Unit, C SW NE 6-1s-2w, wildcat in the Blue Bell area, Duchesne County, Utah. The well is believed to be in Wasatch formation at that depth, and the operator will perforate and test the well up the hole. A number of shows have been found in the well, which was continuously diamond cored from about 8,000 ft. However, successive drill-stem tests have failed to have commercial recoveries, and there is apparently some question whether or not the well will be of commercial status. This wildcat is 5 miles southwest of the two operators' basal Green River formation production at Roosevelt, Uintah County, where oil production is obtained at around 9,200 ft. Carter and Stanolind have two producing wells in Roosevelt.

There is presently an extensive wildcat-drilling campaign through this portion of the Uintah basin, with six wells in addition to the Blue Bell wildcat underway. Recently The California Co. made a discovery at Red Wash, 50 miles east of Blue Bell, with production from basal Green River at 5,000 ft.

COLORADO WILDCAT FAILURE

Wildcat, Yuma County: Steelco Drilling Co. 1 Johnson, SW NW SW 1-4n-47w, TD 4,266 ft., abandoned. Niobrara 2,950 ft., Fort Hays 3,275 ft., Codell sand 3,320 ft.

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Greenhorn 3,540 ft., first sand (Muddy) 3,735 ft., second sand "J" (Dakota) 3,835 ft., third sand (second Dakota) 4,030 ft., fourth sand (third Dakota) 4,200 ft., Morrison 4,245 ft.

WYOMING SUCCESSFUL WILDCAT

East Meadow Creek, Johnson County: American Liberty Oil Co. 1 W. P. Irvine, SW SE NE 18-41n-77w; 7,882 ft. TD; pumped 12 bbl. oil per day. Sussex 3,995 ft., Shannon 4,496 ft., first Frontier 6,410 ft., Lakota 7,752 ft.

WYOMING WILDCAT FAILURE

South Dakota High, Niobrara County: Roy A. Sharp et al 1 Alter, SE SW SW 14-34n-65w, TD 820 ft., abandoned.

NEBRASKA WILDCAT FAILURE

Bridgeport, Morrill County: Buehler & Knox 2 Nerud, CNL SE SE 21-19n-51w, TD 4,680 ft., abandoned. First sand 4,241 ft., Muddy 4,396 ft., third Dakota 4,574 ft.

Oklahoma

Lindsay Discovery Well Gets Good Hunton Flow

ONE of the best wells yet to be completed in the Chimney Hill (Hunton lime) pay zone of the Lindsay pool, Garvin County, is indicated by production tests in that zone by Republic Natural Gas Co. at its 1-X Harris, C SE NW 34-5n-4w, the pool's discovery well, originally completed in January 1950 with production from the much deeper first and second Bromide sands.

With casing perforated at 9,943-72 ft. (opposite the Chimney Hill zone), the well flowed 405 bbl. of clean oil through ½-in. choke in 18 hours before being acidized. Following pumping of 2,500-gal. of acid into the formation, it flowed 50 bbl. of oil per hour through the same sized choke. Tubing pressure while flowing was 500 psi. Gas-oil ratio was 1,225 cu. ft. per barrel. Gravity of the oil was 45°.

Operators propose to open additional pay in the Bromide section, and then complete the well as a dual producer from both horizons. The Bromide sands have been open at 10,878-11,025 ft. Hole originally was drilled to a total depth of 11,029 ft. and then plugged back to 11,029 ft.

Production of the newly developing Peavine Wilcox sand pool in northern Oklahoma County, has been extended about ½ mile to the south where Gulf Oil Corp. is completing its 1 Jeanne Cox, in the NW SW NW 11-14n-2w. The well, with sand open at 6,189-6,214 ft. (total depth), flowed 76 bbl. of clean oil in 5½ hours. Flow for 1 hour was through 25/64-in. choke and for 4½ hours through 20/64-in. choke. This is the sixth producer for the pool, opened last November by Harper & Turner.

Promising oil showings have been obtained in a rank wildcat in southern Grant County. The test is L. B. Jackson 1 McNally, C NW NE 35-25n-15w, 5 miles east and a little north of Waynoka. Showings were in a sand corresponding to the Manning sand in the rapidly expanding Ringwood field, 28 miles to the southeast in Major County. The zone was logged at 5,990-6,125 ft. The sand was tight, and no drill-stem tests were made. Hole is being deepened to its Wilcox sand objective.

OKLAHOMA SUCCESSFUL WILDCATS

Major County: NW extension to Ringwood—Mazda 1 Walker, NE SW SW 22-22n-11w, flowed 176 bbl. of oil per day from Manning at 8,719-6,834 ft., TD 7,045 ft., Big lime-Oswego 6,282 ft., Mississippi lime 7,034 ft.

Muskogee County: New pay in Transcontinental—Ozan Oil Co. and H. L. Swindler 2 Jackson, NE SW SW 8-13n-16e, pumped 35 bbl. of 41°-gravity oil per day from Big lime at 1,730-37 ft., TD 1,781 ft.

Payne County: Wilcox Oil Co. 1 Gould, NW NW NW 25-20n-4e, pumped 49 bbl. of 36°-gravity oil per day from lower Skinner at 3,526-36 ft., TD 4,014 ft., Avant 2,236 ft., Checkerboard 2,932 ft., Peru 3,066 ft., Big lime-Oswego 3,146 ft., Verdigris 3,428 ft., Red Fork 3,586 ft., Mississippi lime 3,848 ft., Woodford 3,973 ft., Viola 4,008 ft.

OKLAHOMA WILDCAT FAILURES

Lincoln County: W. O. Allen 1 Elliott, NW NW NE 19-14n-5e, Davenport area, dry, TD 3,681 ft., Hogshooter 2,510 ft., Layton 2,522 ft., Checkerboard 2,855 ft., conglomerate 2,863 ft., Oswego 3,586 ft., Prue 3,639 ft.

Love County: Red River Oil Co. 1 Pitts, NE SW SE 12-6s-1e, dry, TD 2,508 ft., shaly sand 899 ft., sand 928 ft. and 1,088 ft., tight sand 1,146 ft., sand 1,164 ft., 1,346 ft., and 1,610 ft., broken sand 1,807 ft., sand 1,993 ft., 3,130 ft., 2,143 ft., 2,195 ft., 2,244 ft., and 2,404 ft.

Marshall County: R. J. Caraway 1 Sparklin, SW NW NE 32-4s-6e, dry, TD 854 ft., Arbuckle 355 ft.

Noble County: T. B. Dirickson 1 Daily, NE NE NE 25-22n-2e, dry, TD 4,144 ft., Avant 2,562 ft., Osage Layton 2,999 ft., Oswego 3,588 ft., Verdigris 3,811 ft., Skinner 3,866 ft., lime 3,908 ft., no Red Fork, Mississippi lime 4,136 ft.

Osage County: L. B. Jackson 1 Osage, SE NW NW 32-23n-6e, dry, TD 3,248 ft., upper Layton 1,825 ft., lower Layton 2,055 ft., Checkerboard 2,272 ft., conglomerate 2,378 ft., Big lime 2,460 ft., Oswego 2,579 ft., Cherokee 2,637 ft., Verdigris 2,675 ft., Skinner 2,755 ft., Mississippi lime 2,985 ft., Woodford 3,191 ft., Simpson 3,208 ft.

Payne County: H. Waggoner & Co. 1 Minnick, SW NW SE 5-18n-6e, dry, TD 3,398 ft., base Oswego 2,839 ft., Prue 2,923 ft., Skinner 3,036 ft., lime 3,080 ft., upper Red Fork 3,093 ft., lower Red Fork 3,125 ft., Mississippi lime 3,396 ft.

Foster Drilling 2 Thompson, SE NW SE 31-18n-5e, dry, TD 3,540 ft., Big lime 3,026 ft., Prue 3,148 ft., lower Skinner

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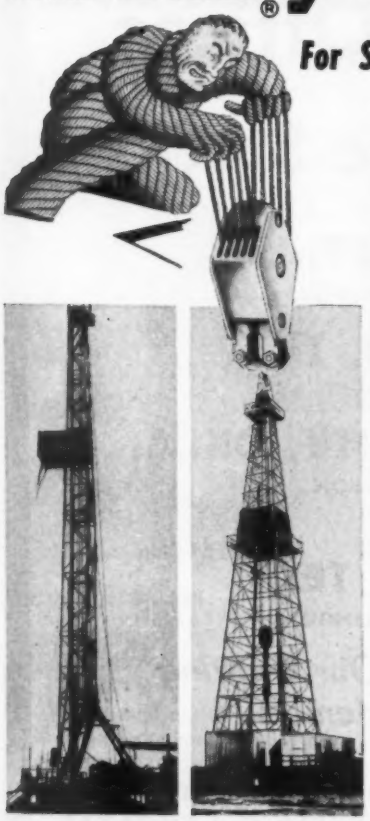

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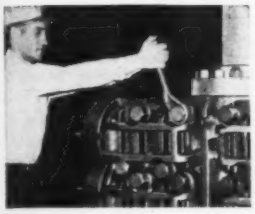
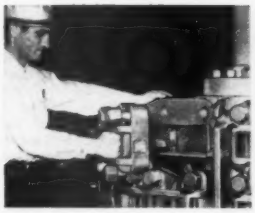
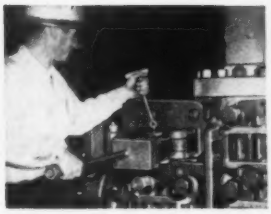


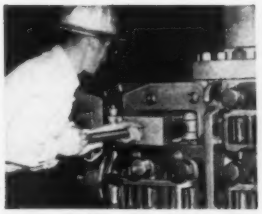
1. Unbolt Two Doors in the side of the Gate. You don't even have to remove the bolts—they remain in the doors where they can't become lost.



2. Swing the Doors Open and pull out the ram assembly. There's nothing to loosen, unlock or disengage. It slides right out.



3. Lift the Rams from the Gate and simply replace the Ram Blocks and rubbers with others of the desired size and type.



4. Slide the Ram Assembly back into the Gate, close and bolt the doors. Closing the doors automatically aligns Ram Assemblies within Gate.

It's as simple as that—and as fast. And here's another important feature—you can make a complete ram change *whether the pipe is in or out of the hole!*

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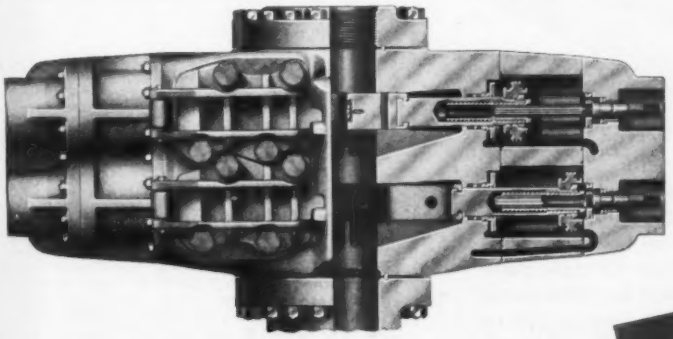

The sectional view above shows how *two* separate ram compartments are unitized into one compact body. Note the self-draining bottoms of the ram compartments . . . the direct hydraulic drive . . . and the completely enclosed design of the Shaffer Hydraulic Cellar Control Gate!

Write for the new Shaffer 1950 Catalog that gives full details on the Shaffer Hydraulic Cellar Control Gate as well as on other Shaffer products!

See pages 4433 to 4496 of the 1950 Composite Catalog.

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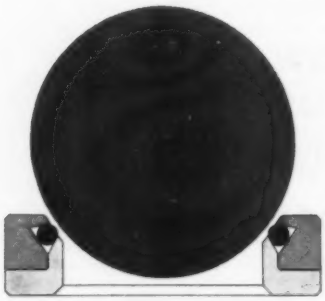

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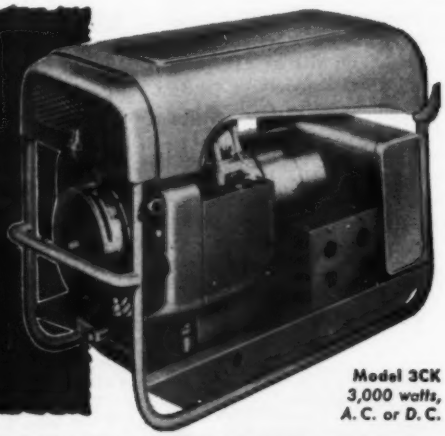

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Pontotoc County: Van-Grisso and Norville 1 Ada Airport, NW NW SE 21-4n-6e, dry, TD 2,100 ft., Calvin 926 ft., Henryetta coal 1,018 ft., Senora sand 1,040 ft., Senora lime 1,042 ft., Wapanucka 1,478 ft., Union Valley 1,685 ft., Cromwell 1,698 ft., lower Cromwell 1,920 ft.

H. E. Turpin 1 Surgner, SW SE SW 21-5n-7e, dry, TD 1,261 ft., Calvin 1,075 ft., broken sand 1,230 ft. with show of oil, sand 1,250 ft. with show of oil.

Woods County: The Texas Co. 1 State "O," NW SW SE 17-29n-19w, dry, TD 7,283 ft., Topeka 3,815 ft., Kansas City 4,860 ft., Mississippi lime 5,710 ft., Woodford 6,813 ft., Viola 6,830 ft., Simpson 7,068 ft., Arbuckle 7,242 ft.

Appalachian-Ohio

Additional Development Planned for Leidy Area

PITTSBURGH.—In Leidy Township, Clinton County, north central Pennsylvania, two new operations have been announced: Sheridan Co. 1 State of Pennsylvania, Tract 3, on the Keating Quadrangle; New York State Natural Gas Corp. N-227 Morris Klewans, on the Tamarack Quadrangle. No completions were reported in the area for the week.

In southwest Pennsylvania, Unity Township, Westmoreland County, Peoples Natural Gas Co. 1-3921 Fred Musnug, elevation 2,100 ft., remains shut down at 8,031 ft. The casing is leaking and this will have to be overcome before drilling is resumed.

Maryland.—In Garrett County, New York State Natural Gas Corp. is digging cellars at 1-N-229 J. W. Bolyard, elevation 2,454 ft., and 1-N-230 C. P. Martin, elevation 2,435 ft. Eberly & Snee completed the 1 Gordon, elevation 2,464 ft., for 295,000 cu. ft. of gas, after acidizing. (See wildcat completion paragraph following).

West Virginia.—In Harts Creek district, Lincoln County, United Fuel Gas Co. PI-6653 W. J. McKenzie gaged 5,116,000 cu. ft. of gas, natural, in the shale with rock pressure of 450 psi. in 24 hours, and total depth of 3,471 ft. In Hardee district, Mingo County, Huntington-Oklahoma Oil Co. and Midway City Gas Co. 3 Cotiga Development Co. resulted in 1,245,000 cu. ft. of gas in the Big lime with total depth 2,360 ft. In Marsh Fork district, Raleigh County, Columbian Carbon Co. 27-GW-1158 Rowland Land Co. tested 1,245,000 cu. ft. of gas in the Big lime; total depth was 3,319 ft. In Grant district, Wayne County, Beechy Branch Gas Co. 2-A Huntington Development & Gas Co. gaged 1,225,000 cu. ft. of gas from the salt sand; total depth was 1,022 ft.

MARYLAND SUCCESSFUL WILDCAT

Garrett County: Eberly & Snee 1 Gordon, elev. 2,464 ft., 295,000 cu. ft. of gas, after acidizing, Onondaga lime 3,695 ft., chert 3,725 ft., gas 3,735 ft., Oriskany sand 3,856 ft., TD 4,031 ft.

OHIO

COLUMBUS.—A new gas pool in Worthington Township, Richland County, is indicated by Lyons & Fierbaugh 1 K. R. Morgan, Section 30. Production was found in the Clinton sand at 2,405-15 ft., and gaged an estimated 1,000,000 cu. ft. of natural gas with a rock pressure of 1,125 psi. The well was shot with 30 qt. and an attempt is now being made to shut in the gas in the casing after the tubing packer blew out.

In the eastern part of New Castle pool in New Castle Township, Coshocton County, Preston Oil 1 James Allen, Section 18, showed for oil and gas in the Clinton sand at 3,279-99 ft., and flowed 65 bbl. of oil in 24 hours after shot. The 2 James Allen was dry and 3 R. J. Daliere made 23 bbl. after shot.

Clark Talbot et al have finished one wild-

cat and are in the lime in another in Scioto County. The 1 Frank Reipenhoff, Section 13, Porter Township, found the Clinton at 2,000-05 ft. It was plugged after showing a very small amount of oil and gas. The other, 1 Scioto Farm Land Co., is in Section 30, Bloom Township.

Locations are still at a low level, due principally to deep mud in the fields. New locations for the week totaled 16 and completions totaled 24.

OHIO WILDCAT FAILURES

Perry County, Monroe Township: Ideal Natural Gas Corp. 1 D. C. Maxwell, Section 7, Clinton 3,650-93 ft., Medina 3,765-70 ft., TD 3,775 ft.

Pleasant Township: Ohio Fuel Oil Co. 1 B. S. Shaver, Section 20, Clinton 3,670-3,700 ft., Medina 3,778-80 ft., TD 3,791 ft.

Southwest Texas

Potential Gage Run on New Pettus Sand Discovery

CORPUS CHRISTI. — Potential gage has been run on McMullen County's new Pettus sand discovery, Sunray Oil Corp. 1 J. E. Murphy, J. C. King Survey 110, Abstract 1134. The well produced 17 bbl. of 21.4°-gravity oil daily from open hole at 3,061-65 ft. On an earlier test, the well tested gas at 2,616-23 ft. in the Government Wells zone, but operator drilled on to the Pettus, topped at 3,060 ft.

Final completion has been made at Milam Drilling Co. 1 J. C. Cox, discovery of the "Goldfinch" field in southeastern Frio County. Through open hole in the Navarro sand at 4,617-30 ft., the well was gaged for 63 bbl. of 35.5°-gravity oil daily through 3/16-in. choke. This new discovery is located in Albert Fisher Survey 229, approximately 4 miles northwest of Charlotte field.

Humble Oil & Refining Co. is linking up gas production in the Divot and Doering Ranch areas of southwestern Frio County. About midway between the two fields, the operator's 2 Naomi Dulnig recovered 5 ft. of gas-cut mud on drill-stem test in the Navarro sand at 4,110-20 ft. Operator then cored to 4,130 ft. in the sand and ran a new test at 4,120-30 ft., with no report on recovery. The well is located in Simon Arriola Survey 304, A-4.

Humble is currently installing pumping equipment at another Navarro sand discovery located in Atascosa County. The discovery, 1-C E. J. Pruitt, Fabricus Reynolds Survey 51, Abstract 719, was drilled to total depth of 5,066 ft. and plugged back to 4,964 ft. for completion. Previously, the well recovered 160 ft. of oil and mud, 50 per cent oil, on drill-stem test at 4,937-67 ft. in the Navarro. Operators ran 2-in. tubing to 4,937 ft., swabbed dry, and recovered approximately 6 bbl. of oil daily. Testing operations will be continued on pump.

In Jim Hogg County, Sun Oil Co. 13 A. C. Jones, "Agua Nueva de Abajo," J. M. Ramirez Survey, Abstract 258, 3 miles east of Jones field, tested oil on drill-stem test, apparently opening a new producing area. Later, a 15-hour test was run on the well. Through perforations at 4,789-91 ft., flow was gaged at 37 bbl. of oil through 7/64-in. choke. Tubing pressure was 725 psi. and casing pressure 1,125 psi. Testing operations are still under way.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Bexar County: Oil discovery—Fred Scharf 1 August H. Ernst, Rolen League and Labor Sur. 48, A-617, TD 1,248 ft., open hole 1,233-48 ft., IP: 7 bbl. oil per day on air lift, 37° gravity.

Guadalupe County: Oil discovery, "No. Francitas"—Sun Oil Co. and The Texas Co. 1 Rogers Unit, J. Powers Sur., A-251, TD 10,000 ft., perf. 8,649-51 ft., IP: 208 bbl. oil per day, 8/64-in. choke, 48.2° gravity, TP 1,900 psi.

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SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Atascosa County: Bill Hormachea 1 Beatrice McLean Flynn, V. Trevino Sur., A-866, dry, TD 1,930 ft.

Bastrop County: Fred J. Adams A-1 Chas. D. Alexander, Joseph Adair Sur., dry, TD 2,386 ft.

Duval County: Argo Oil Corp. 13 J. M. Bennett, CEPI&M Sur. 38, 12 mi. NW of Realitos, dry, TD 3,711 ft.

John F. Camp & Sons, et al, 2 Clara Driscoll Estate, Santa Rosalia Grant, 15 mi. W of Benavides, dry, TD 3,902 ft.

Salt Dome Production Co., et al, 1 Maria Maclovia Garza, et al, GH&H Sur. 63, A-248, dry, TD 4,882 ft.

The Texas Co. 1 Duval County Ranch Co. Fee-NCT 27, Pedro G. Salinas Sur. 258, A-1,949, dry, TD 3,510 ft.

Frio County: Martin, Shelly & Thomas 1 Leo Newson, Pedro Flores Morales Sur. 1414, A-497, dry, TD 4,412 ft.

Jim Wells County: Rowan & Hope 1 E. M. Stone, Santos Moreno "La Trinidad" Grant 439, A-300, dry, TD 6,252 ft.

Milam County: Rolan B. Paxson, et al, 1 Herman Fuessel, Abigail Fokes Sur., dry, TD 1,056 ft.

Zapata County: The Texas Co. 1 J. C. Martin, Jose Basquez Borego Grant, A-209, dry, TD 2,855 ft.

Michigan

Oceana County Wildcat Strikes Oil in Traverse

MOUNT PLEASANT.—Gulf Refining Co. 1 Ruckel, NE SW NW 18-14n-18w, Benona Township wildcat, Oceana County, was swabbing and flowing oil from the Traverse at midweek after cleanout and plugback. Hole was originally drilled to 1,763 ft. where some salt water was found then plugged back to 1,760 ft. with 800 lb. of lead wool. Tests were being run to determine if a satisfactory bottom-hole water shutoff had been effected. If water shuts off successfully, tubing will be run and the well will be acidized. Top of Traverse was logged at 1,732 ft., and porosity was logged at 1,735-63 ft. Bottom 3 ft. was reported to be showing water sand.

The 5-in. casing was cemented at 1,732 ft. About 24 hours after cement plug had been drilled out the hole stood full of fluid and an estimated 40 bbl. of oil, water, and drilling mud were swabbed to pits. Next day 38 bbl. of clean oil was swabbed to tanks in 2 hours. On Wednesday of this week fluid stood at 1,650 ft. Hole had then been plugged back to 1,761 ft. When swab was run to 600 ft. of top of hole, well started to flow. A total of 52 bbl. of oil and 10 bbl. of water was swabbed and flowed to tanks in 10 hours. Further plugback was completed. On the following morning when bailer was run once, fluid level was standing at 1,350 ft., and the well kicked off and started to flow.

Checking in from 20 to 30 ft. higher than surrounding control points on upper and the Traverse objective, Mogul Oil Co. 1 Hammar, SW SW NE 20-20n-9w, Sherman Township wildcat, Osceola County, was the most closely watched wildcat in the Michigan basin this week. Wildcat will test Dundee-Reed City zone oil objectives.

MICHIGAN WILDCAT FAILURES

Allegan County, Ganges Township: Louis Zellman 1 Sisson, NE SW NE 27-2n-16w, Traverse 1,210 ft., dry, TD 1,218 ft.

Lee Township: Fisher-McCall Oil & Gas, Inc. Jensen Estate, SE SE SW 22-1n-15w, Traverse 1,195 ft., dry, TD 1,228 ft.

Arenac County, Standish Township: Don Rayburn 1 Senske, SE NW SW 14-18n-4e, dry in Sylvania, TD 4,950 ft.

Huron County, Dwight Township: Harry Koplin S½ SW SE 21-18n-13e, Dundee 2,302 ft., dry, TD 3,000 ft.

Van Buren County, Bloomingdale Township: Granville C. Berlin 1 Burris, SE SE SW 21-1s-14w, Traverse 1,335 ft., dry, TD 1,371 ft.

South Louisiana

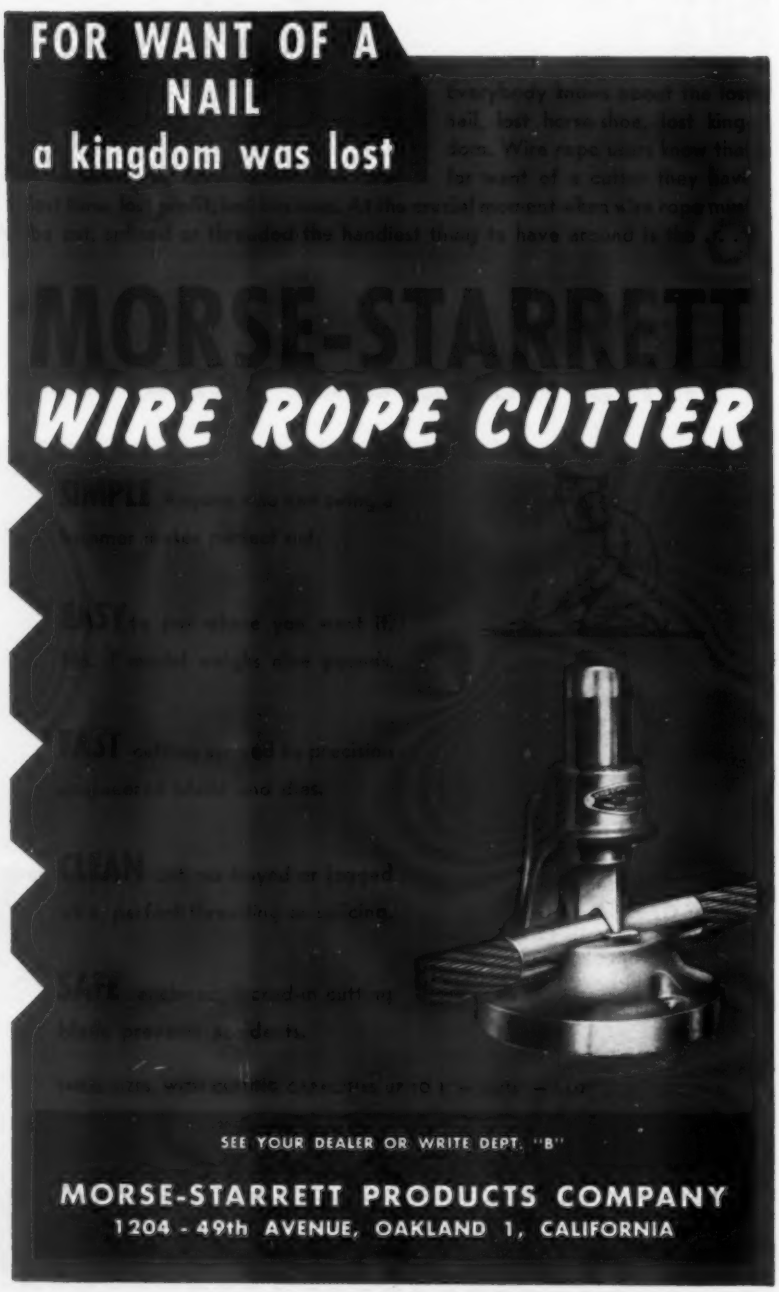
The California Co. Stakes Four Romere Pass Tests

NEW ORLEANS.—Continuing its rapid development program in Romere Pass field of Plaquemines Parish, The California Co. has staked locations for four new tests in the pool. The company's 18 Romere Pass Unit, 22-20s-19e, has projected depth of 9,820 ft. The firm has awarded contract for 19 Romere Pass Unit, 23-20s-19e, which has a scheduled depth of 9,850 ft.; and 24 Romere Pass Unit, 23-20s-19e, with a proposed depth of 9,925 ft. The fourth test, 31 Romere Pass Unit, 21-20s-19e, will be drilled to a depth of 9,875 ft.

Humble Oil & Refining Co. has plugged and abandoned 1 State Lease, 1,869-Four League Bay, wildcat in 32-20s-13e, in the Four League Bay area of Terrebonne Parish, at total depth of 14,395 ft. Operator plugged the well back to 14,053 ft. after cementing 7-in. casing at 14,256 ft. Drillstem tests were run at 14,117-28 ft., 13,742-49 ft., 13,004-12 ft., and 11,821-28 ft., but none could establish commercial production.

Three new wildcats were staked in South Louisiana during the week. Niloco Co. and Bel Oil Corp. are building roads for 1 J. A. Bel, 7,500 ft. test located in 25-6s-7w, Allen Parish. Proposed depth is expected to test the Basal Frio.

Approximately 1 mile north of production in North Woodlawn field, Jefferson Davis Parish, Atlantic Refining Co. has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staked location for 1 W. E. Walker, 9-9s-6w. Proposed depth of the wildcat is 11,200 ft.

T. G. Murray will drill a 12,000-ft. wildcat test in the south Pawnee area of Evangeline Parish. The venture is 1 Bowman-Hicks, C SE SW 32-2s-2w, which is approximately 4 miles south and slightly east of the town of Pawnee. This venture is located 1½ miles northwest of Danciger Oil & Refining Co. 1 Bowman-Hicks, which was abandoned in January 1944 at total depth of 9,764 ft. Top of the Wilcox was logged at 9,290 ft., but no shows were reported in the well.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

Lafourche Parish: Oil discovery, "Brustle Prospect"—Superior Oil Corp. 1 Clovelly Corp., 33-18s-22e, TD 13,930 ft., perf. 12,305-15 ft., IP: 194 bbl. oil per day, 7/16-in. choke, 32.3° gravity, TP 1,750 psi.

SOUTH LOUISIANA WILDCAT FAILURE

Cameron Parish: Magnolia Petroleum Co. 1 Lutcher Stark "C," 1-15s-12w, dry, TD 12,508 ft.

North Central Texas

Continental Leases 20,000 Acres in Montague County

WICHITA FALLS. — Continental Oil Co. was reported to have taken 10-year leases on some 20,000 acres in Montague County, southeast and east of Saint Jo, extending into southwest Cooke County. Approximately 8,000 acres was around the town of Freemong and another 5,000 acres in the vicinity of Rosston. A geophysical party was reported working the area.

Casing was being run to top of the Ellenburger at Stanolind Oil & Gas Co. 1 M. A. Glass, prospective discovery in southwestern Fisher County. Corrected top of the formation was 7,324 ft. Completion attempt was to be made in open hole to 7,347 ft., total depth.

Previous to surveying, a 2-hour drill-stem test from 7,297-7,327 ft. had gas in 6 minutes and oil in 65 minutes. It flowed an estimated 37 bbl. of 47°-gravity oil an hour. There was no water in the recovery.

First test of the Ellenburger at 7,281-7,313 ft. was 1,880 ft. of clean oil and 570 ft. of heavily oil-cut mud in 5 hours.

In Haskell County, Continental Oil Co. 1 Maggie Martin, wildcat 3 miles southwest of Rochester, had casing run to 5,865 ft. Total depth was 6,107 ft., about 9 ft. into the Ellenburger. The lower formation carried water and tests were to be made higher in the hole. Drill-stem tests were said to have recovered oil.

Crown Central Petroleum Co. 1 Overby, 5 miles southwest of Haskell, had casing set to 4,928 ft. and perforated from 4,801-07 ft. for completion attempt. Total depth was 5,669 ft. Crown Central had east and south offsets under way.

In Knox County, T. D. Humphrey 1 Mrs. Mattie Davis, west of Knox City, was to complete in open hole in the Strawn. Hole was drilled to 6,020 ft. then plugged back to 5,145 ft. and cased to 5,110 ft. A previous test of the Strawn at 5,118-22 ft. recovered 110 ft. of free oil.

Sun Oil Co. 1 Costephens, Nolan County wildcat southwest of Roscoe, recovered 700 ft. of salt water on a 2-hour drill-stem test at 4,626-37 ft. Formation was unidentified. It was drilling ahead on a 7,350-ft. contract.

Southwest of Sweetwater, Intex Oil Co. 1 Riggs was drilling limestone at 6,388 ft. Cities Service Oil Co. 1-B Etheredge, southeast of Wastella, was drilled below 6,957 ft.

Three miles northwest of Nugent in Jones County, Woodley Petroleum Co. 1-A Lewis completed as a Bluff Creek sand discovery, pumping 106.6 bbl. of 28°-gravity oil in 19 hours. The well had 5 ft. of pay from 1,870 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Clay County: Stephens Petroleum Co. 1 Bryant Edwards, T&NO Sur., 4 mi. SE Henrietta, 2 mi. W Bryant Edwards Simpson field, TD 6,511 ft., Simpson 6,196 ft., perf. 6,227-51 ft., flowed 307 bbl. 44°-gravity oil a day, ¾-in. choke, TP 800 psi., GOR 680 cu. ft.

Comanche County: J. K. Wadley et al 1 J. A. Ward, ETRR Sur., 3½ mi. SW Sidney, TD 2,619 ft., Marble Falls 2,193 ft., perf. 2,127-2,204 ft., 4,000 cu. ft. gas.

Haskell County: Anderson-Prichard Oil Corp. 1 Maude Harber, 145-45-H&TC, 5 mi. N NE Weinert, TD 5,467 ft., pay 4,723 ft., pumped 8 bbl. oil a day.

Jack County: J. C. Jennings 1 J. R. Clayton, TE&L Sur. 3333, 3 mi. NE Jermyn, TD 4,685 ft., Caddo 4,480 ft., perf. 4,502-18 ft., flowed 364 bbl. 43°-gravity oil a day, 16/64-in. choke, TP 600 psi.

Texas-Canadian Oil Corp. 1-A M. M. Garrett, BBB&C Sur., 2½ mi. NW Antelope, TD 5,737 ft., perf. Strawn sand 3,038-43 ft., pumped 79.46 bbl. 40°-gravity oil in 14 hr., GOR 525 cu. ft.

Jones County: West Central Drilling Co. 1 J. M. Alexander, 2-14-T&P, 3 mi. NE Nugent, TD 1,588 ft., pay 1,580 ft., pumped 90 bbl. 40°-gravity oil a day.

Woodley Petroleum Co. 1-A H. F. Lewis, Catherine Allen Sur., 3 mi. NW Nugent, TD 1,875 ft., pay sand 1,870 ft., pumped 116 bbl. oil a day.

Stephens County: Robert Sunshine 1 D. M. Stanford, 45-6-T&P, 14 mi. N Ranger, TD 1,990 ft., pay sand 1,984 ft., pumped 87.5 bbl. oil a day.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: Constantin and Rogers 1 Ikard est., Jefferson CSL, 11 mi. SE Archer City, dry, TD 3,815 ft.

R. W. Darden 1 Tom Bass, TE&L Sur., 5 mi. SE Megargel, dry, TD 1,336 ft.

R. W. Darden 2 Bass, TE&L Sur., 4½ mi. SE Megargel, dry, TD 1,260 ft.

R. W. Darden 1-A Estell-Key, TE&L Sur., 1 mi. NE Megargel, dry, TD 1,432 ft.

McElroy Ranch Co. 1 L. F. Wilson "B," ATNCL Sur., 3 mi. NE Geraldine, dry, TD 4,062 ft.

Perkins Brothers 2 Olin Calvin, R. Grooms Sur., 3 mi. SE Anarene, dry, TD 989 ft., Gunsight 979-983 ft.

Callahan County: Fain & McGaha 1 B. A. & Ray Elliott, on line of Sections 54 and 55, LAL Sur., 8 mi. SW Moran, dry, TD 4,172 ft., elev. 1,430 ft., Caddo 3,445 ft., Lake sand 3,854 ft., Mississippian 4,111 ft., Ellenburger 4,116 ft.

Coleman County: W. J. Murray 1 J. P. McCord, BBB&C Sur., 3 mil. SW Rock Crusher, dry, TD 3,456 ft., elev. 2,119 ft., Morris 3,051 ft., Gardner 3,330 ft., Gray 3,400 ft.

C. V. Norton 1 Luther Holder, GH&H

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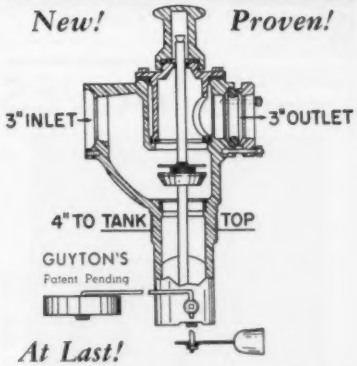

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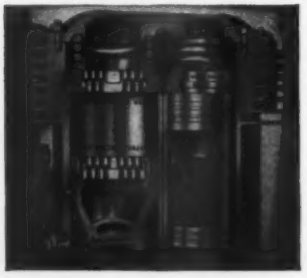

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Haynes B. Ownby 1 Mrs. M. B. Burroughs, 4-1-HT&B, 5 mi. SE Novice, dry, TD 3,250 ft., elev. 1,954 ft., Adams 2,341 ft., Jennings 3,156 ft., Gardner 3,235 ft.

Cooke County: Trumter Petroleum Corp. 1 O. B. Anderson, E. C. Young Sur., 4 mi. S Era, dry, TD 2,102 ft.

Eastland County: Cooper & Hemphill 1 M. A. Clyatt, 31-4-H&TC, 3 mi. NW Eastland, dry, TD 3,570 ft.

S. D. Johnson 1 G. P. Fee, 59-4-H&TC, 3 mi. W Eastland, dry, TD 3,725 ft., elev. 1,547 ft., Caddo 3,123 ft., Lake 3,350 ft.

Jack County: S. D. Johnson 1 Thomas, J. S. Porter Sur., 6 mi. S Antelope, dry, TD 4,858 ft.

Jones County: Texo Oil Co. 1 R. G. Young, B. Trivens Sur., 12 mi. NE Abilene, dry, TD 2,610 ft., elev. 1,611 ft., Flippen 1,857 ft.

Montague County: Gulf Oil Corp. 61 Earl Spring, 39-4-HTC, 5½ mi. SW Ringgold, dry, TD 6,300 ft.

Palo Pinto County: L. A. McDonald 2 Hazel Wilbar, James Latham Sur., 1½ mi. SW Gordon, dry, TD 1,800 ft.

Stephens County: McElroy Ranch Co. 1 C. M. Caldwell, TE&L Sur., 9 mi. W Breckenridge, dry, TD 2,465 ft.

Taylor County: W. D. Brookover 1 Gus Glenewenkel, Guadalupe CSL, 7 mi. SE Merkel, dry, TD 5,140 ft.

Clark & Cowden Drilling Corp. et al 1 J. L. Edmondson, W. E. Vaughn Sur., 2 mi. SW Wylie, dry, TD 4,601 ft.

Throckmorton County: R. Clay Underwood 1 J. B. Matthews, Comanche Indian Reservation, 10 mi. SW Throckmorton, dry, TD 3,002 ft.

Young County: Ben Rankin 1 I. L. Jones, TE&L Sur., 8 mi. SW Olney, dry, TD 4,945 ft., Mississippian 4,871 ft.

Kansas

Sedgwick County Test Indicates New Oil Pool

PROMISING Arbuckle production has been discovered in a wildcat 4 miles east of Wichita, in eastern Sedgwick County, where A. D. Allison and Aledo Oil & Gas Co. recovered 2,280 ft. of clean oil and 160 ft. of oil-cut mud in their 1 Faulk, SE SW SE 11-27-2e. The Arbuckle pay zone was topped at 3,245 ft. (—1,911 ft.). The test, with tool open 30 minutes, took in an interval at 3,250-57 ft. Following the test, hole was deepened to 3,288 ft., where casing has been run for completion. The discovery is 4 miles from other production.

Aladdin Petroleum Corp. and Crowe Drilling Co. have a prospective Mississippian gas well in their 1 Goering, SW SW SW 4-21-1, a wildcat located 1½ miles north of the Graber pool, in southeastern McPherson County. During a 60-minute drill-stem test of an interval at 3,008-20 ft., in the Mississippian, topped at 2,936 ft. (—1,435 ft.), the well flowed at an estimated rate of 3,000,000 cu. ft. of dry gas per day. Approximately 150 ft. of oil and gas-cut mud and 480 ft. of water was recovered in the pipe breakdown. An earlier drill-stem test at 2,971-3,005 ft., with tool open only 10 minutes, had gas at the surface in 3 minutes and yielded 63 ft. of gas-cut mud. Indicated bottom-hole pressure in the first test was 920 psi. Hole was deepened to the Arbuckle, logged at 3,539-56 ft., but no additional showings of importance were obtained. Casing has been run through the Mississippian gas zone to 3,146 ft.

Skelly Oil Co. has completed its 1 Theis, SW SW NE 5-34-25, southwestern Clark County wildcat, to open another Mississippian gas pool in the southwestern part of the state. The well flowed 7,000,000 cu. ft. of gas per day on potential tests from casing perforations at 5,588-5,905 ft. and 5,532-55 ft. Top of the formation is 5,531 ft. with surface elevation at 2,118 ft. This discovery is about 3 miles east of the McKinney gas pool, southeastern Meade County, opened by the same operator late last year.

Harry Gore 1 Law, NE NE SE 34-9-23, which opens a new pool in the south central part of Graham County, pumped and flowed at the rate of 30 bbl. of 38°-gravity oil per hour while testing its Lansing-Kansas City pay zone. Casing, cemented through the zone to 4,000 ft., is perforated at 3,922-34 ft. Top of the section is 3,741 ft. (—1,283 ft.). Pay zone was treated with 5,000 gal. of acid before testing. Hole had been drilled to 4,218 ft. in Arbuckle lime, topped at 4,203 ft., but no important showings were found below the present pay zone. Nearest other production is in the Fargo pool, 7 miles to the northeast.

KANSAS SUCCESSFUL WILDCATS

Clark County: Skelly Oil Co. 1 Theis, SW SW NE 5-34s-25k, flowed 783,000 cu. ft. of gas per day from Mississippi lime at 5,532-55 ft. and 5,588-5,610 ft., TD 6,042 ft., Lansing-Kansas City 4,470 ft., Meramec 5,733 ft., St. Genevieve 5,873 ft.

Phillips County: Bay Petroleum 1 Roland, SW SW SW 21-1s-17w, pumped 83 bbl. of oil per day from Lansing at 3,597-3,618 ft., TD 3,758 ft., Topeka 3,238 ft., Heebner 3,454 ft., Toronto 3,484 ft., no Arbuckle.

Honaker 1 Gebhart, NW NE NW 7-1s-18w, pumped 6 bbl. of oil per day from Lansing at 3,408-12 ft., TD 3,449 ft.

Honaker 1 Kent, NE SE SE 22-1s-18w, pumped 20 bbl. of oil per day from Lansing at 3,432-3,505 ft., TD; anhydrite 1,735 ft., Heebner 3,308 ft.

Stafford County: Armer 1 Gates "B," SE SE SW 27-21s-14w, 2,457 bbl. of oil per day from Lansing at 3,522-33 ft., TD 3,787 ft., Heebner 3,278 ft., lime 3,393 ft., Sooy 3,672 ft., Viola 3,680 ft., Simpson shale 3,721 ft., Simpson sand 3,748 ft., Arbuckle 3,772 ft.

Lewis 1 Sleeper, SW SW SE 22-22s-11w, 683 bbl. of 50°-gravity oil per day from Sooy at 3,581-90 ft., TD; Heebner 3,091 ft., lime 3,232 ft., Lansing-Kansas City 3,257 ft.

KANSAS WILDCAT FAILURES

Butler County: Gould et al 1 Davies, SW NW NW 14-29s-3e, dry, TD 2,302 ft., Kansas City 2,247 ft.

Ellis County: Heathman 1 Richards, CEL E/2 NW 17-11s-18w, dry, TD 3,503 ft., anhydrite 1,212 ft., Heebner 3,132 ft., Lansing-Kansas City 3,175 ft., Sooy 3,444 ft., cherty Sooy 3,456 ft.

Graham County: Republic Natural 1 Brobst, SW SW NW 12-6s-21w, dry, TD 3,663 ft., anhydrite 1,765 ft., Heebner 3,343 ft., Toronto 3,362 ft., Lansing-Kansas City 3,383 ft., granite wash 3,613 ft., weathered granite 3,634 ft., granite 3,660 ft.

Jones-Shelburne & Farmer 1 Miller "B," SW SW NW 22-10s-21w, dry, TD 3,850 ft., Heebner 3,400 ft., Lansing-Kansas City 3,442 ft., Sooy 3,766 ft., Arbuckle 3,818 ft.

Hodgeman County: Metropolitan 1 O'Brien, C NW NE 18-12s-25w, dry, TD 4,935 ft., anhydrite 1,612 ft., lime 3,849 ft., Lansing-Kansas City 3,869 ft., Marmaton 4,210 ft., Cherokee 4,410 ft., Mississippi lime 4,542 ft., Viola 4,699 ft., Arbuckle 4,883 ft.

McPherson County: Continental Oil Co. 1 Stutzman, SW SW SE 1-20s-5w, dry, TD 3,476 ft., Heebner 2,516 ft., Lansing-Kansas City 2,704 ft., Mississippi lime 3,394 ft.

Rooks County: Musgrove 1 Neu, NW NW SE 18-9s-18w, dry, TD 3,682 ft., anhydrite 1,507 ft., Heebner 3,282 ft., Lansing-Kansas City 3,318 ft., Sooy 3,546 ft., Arbuckle 3,669 ft.

Saline County: Franco-Central & Penguin 1 Bloomquist, NE NE SW 11-16s-4w, dry, TD 3,640 ft., Lansing-Kansas City 2,291 ft., Mississippi lime 2,942 ft., Kinderhook 3,235 ft., Maquoketa 3,461 ft., Viola 3,515 ft., Simpson 3,595 ft.

Sedgwick County: Alpine 1 Carey, NW NW NE 34-25s-1e, dry, TD 3,585 ft., Lansing 2,278 ft., Kansas City 2,558 ft., Burgess 3,004 ft., Mississippi lime 3,054 ft., Hunton 3,436 ft., Simpson 3,485 ft., Arbuckle 3,571 ft.

Hartman 1 Rae, CEL NW SE 9-27s-2e, dry,

TD 3,400 ft., Lansing-Kansas City 2,196 (?) ft., Mississippi lime 2,973 ft., Kinderhook 3,227 ft., Viola 3,278 ft., Simpson sand 3,293 ft., Arbuckle 3,395 ft.

Stafford County: Anschutz 1 DeBusk, NW NW SW 19-24s-14w, dry, TD 4,540 ft., anhydrite 965 ft., Heebner 3,625 ft., Toronto 3,643 ft., lime 3,767 ft., Lansing-Kansas City 3,792 ft., Sooy 4,183 ft., Viola 4,399 ft., Simpson 4,417 ft., Arbuckle 4,490 ft.

EASTERN NEBRASKA WILDCAT FAILURE

Richardson County: Skelly Oil Co. 1 Maddox, SW SW NE 27-2n-16e, dry, TD 3,511 ft., base Mississippian 2,205 ft., Hunton 3,419 ft.

Permian Basin

Upton County Prospect Tests Good Oil Show

MIDLAND.—Coring and testing was going ahead at Sinclair Oil & Gas Co. 1 McElroy Ranch, Upton County Ellenburger prospect.

Drill-stem test from 12,318-73 ft., open 2 hours, had gas in 58 minutes and oil in 70 minutes and gaged 85 bbl. of oil in 1 hour, with no water. Core to 12,373 ft. had recovered 43 ft. of dolomite with good porosity and staining. Core recovery from 12,373-420 ft. was 44½ ft. of lime, of which 4 ft. had good oil shows, 8 ft. had slight oil shows, and 32½ ft. had no shows. At last report a drill-stem test of the interval was under way.

Ashland Oil & Refining Co. was reported ready to reenter its 1 Lindsay, Martin County wildcat, 14 miles west and a little north of Stanton, to test the lower Spraberry. Old total depth was 7,885 ft. which had penetrated the upper Spraberry.

Plymouth Oil Co. 1 Jefferson Davis, east of Stanton, plugged back from the Dean sand at 7,784 ft. to run tests in the Spraberry sand topped at 6,800 ft. First perforations were at 7,120-50 ft. The section was treated with Hydrafrac, and swabbing recovered load oil. The section was squeezed and perforated from 6,934-7,010 ft.

Callery & Hurt, Inc., and others' 1 Earl B. Powell, deep wildcat north of Stanton, was running electrical surveys to 11,546 ft., total depth. It had the Spraberry at 7,036 ft., and the Devonian at 11,035 ft., according to reports.

Southeast of Stanton, Stanolind Oil & Gas Co. 1-A Mulkey was shut down for orders after recovering aproximately 1,000 ft. of drilling mud with very light oil show, on a drill-stem test in the Spraberry from 7,332-7,446 ft.

Four miles southeast of the Benedum field, in Reagan County, Humble Oil & Refining Co. 1-N University recovered 78 bbl. of oil and some salt water in 14 hours of swabbing to 7,342 ft., total depth. Formation tops had not been reported but the oil was said to be from the Spraberry.

Southeast of Midland, Moore Exploration Co. 1 A. R. Bauman topped the Spraberry at 7,700 ft. on elevation of 2,778 ft. and prepared to drill-stem test. An earlier test of the section failed mechanically.

In northwestern Coke County, Sun Oil Co. 2 Bloodworth had discovery production in Strawn sand, or a long northeast extension to the Lygay field. The well was dry in Strawn lime at 6,660 ft. and plugged back to 5,920 ft. Perforations from 5,664-69 ft. developed a natural flow of 57 bbl. of oil in 24 hours through ¼-in. tubing choke.

Seventh producer for the Ropes field of Hockley County was completed as Honolulu and Signal 2 M. D. Underwood, west offset to the discovery. Based on a 6-hour flow through 1-in. opening, the well made a daily potential of 2,707 bbl. of 42°-gravity oil from Pennsylvanian pay at 9,323-9,410 ft.

In northeastern Hockley County, George P. Livermore 1 Wood found sulfur water in Pennsylvanian limestone, tentatively identified as Canyon reef, from 9,620-71 ft. Top of reef was 9,660 ft., minus 6,245 ft.

In Schleicher County, Hiawatha Oil & Gas Co. 2 Runge, northeast offset to its lower Canyon discovery, Hulldale North field, was dry in that formation and was drilling ahead below 5,930 ft. on an Ellenburger contract. Hiawatha has southwest and north offsets to the discovery.

In southeast Irion County, Frankel Bros. and Shell Oil Co. 1 Rawls found no further shows below the Wolfcamp and prepared to plug back from 7,402 ft. for completion attempt. The well was in the Ellenburger at total depth, but top had not been placed. The well flowed 48 bbl. of 38°-gravity oil an hour on drill-stem test from 5,455-5,515 ft.

In Floyd County Houston Oil Co. 1 Lackey reported top of the Fullerton sand of the Clear Fork at 3,660 ft. on elevation of 3,184 ft. The marker was said to be some 270 ft. high to Humble's 1 Merriwether, dry hole 4 miles to the southwest. It was drilling ahead below 4,270 ft.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Concho County: Lamb & Ford Drilling Co. 1 Bessie Baker, F. Wurzback Sur., 4 mi. NW Melvin, dry, TD 2,000 ft.

M. C. Moore 1 Robert Wilson, 76-8-H&TC, dry, TD 3,825 ft., elev. 2,319 ft., Strawn 3,650 ft., lower Strawn 3,725 ft., Hickory 3,888 ft., Ellenburger conglomerate 3,838 ft.

Skelly Oil Co. 1 H. E. McCulloch, T. J. Caswell Sur., 5½ mi. NE Millersview, dry, TD 3,097 ft., Dothan 595 ft., Home Creek 1,623 ft., Caddo 2,706 ft., Marble Falls 2,750 ft., Ellenburger 2,845 ft.

Cottle County: Sun Oil Co. 1 L. Hughes,

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E. P. Knott and W. B. Plemens Sur., dry, TD 8,023 ft., elev. 1,997 ft., Wolfcamp 2,865 ft., Pennsylvanian shale 4,170 ft., reef 4,925 ft., Mississippian 7,363 ft., Ellenburger 8,005 ft.

Crockett County: E. B. Fletcher 1 Sinclair-Shannon, 2-10-GC&SF, 21 mi. NW Ozona, dry, TD 2,505 ft.

Sinclair Oil & Gas Co. 1 Nettie Holt, 35-OP-GC&SF, 10 mi. N Ozona, dry, TD 1,456 ft., San Andres 1,445 ft.

Reagan County: Union Oil Co. of California 1-76 University Lands, Sec. 10, 3 mi. W Big Lake, dry, TD 10,367 ft., elev. 2,658 ft., Spraberry 5,320 ft., base Dean 6,940 ft., Strawn 9,097 ft., Devonian 9,298 ft., Silurian 9,600 ft., Simpson 9,694 ft., Ellenburger 9,855 ft.

Schleicher County: Cooper Gas Co. 1 Loveless, T. J. Cartwright Sur., dry, TD 5,854 ft.

Stewart and Daniel 1 Will Lovelace, 4-M-GH&SA, 8 mi. E Eldodaro, dry, TD 1,050 ft.

Sutton County: Placid Oil Co. 1 E. S. Mayer, 36-d-GC&SF, 8 mi. W Sonora, dry, TD 9,239 ft., elev. 2,191 ft., Ellenburger 8,427 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Oldham County: George P. Livermore, Inc. 1 Moser, 26-7n-1e, dry, TD 6,922 ft., elev. 3,881 ft.

SOUTHEAST NEW MEXICO

HOBBS.—Lawton Oil Corp. and W. L. Goldston 1-A State, Lea County wildcat in 30-15s-33e, was drilling ahead below 12,102 ft. in limestone following a test at 10,166-10,212 ft. Using 1,000 ft. of water blanket, it produced gas at the surface in 50 minutes and unloaded the water blanket cut with oil, 1,980 ft. of clean oil, and 510 ft. of mud-cut oil while pulling casing. Last marker reported was the Wolfcamp at 9,256 ft.

Magnolia Petroleum Co. 2-B Betenbaugh, extension try on the west side of the Bough Pennsylvanian field, was drilling in shale at 7,535 ft. A drill-stem test in the San Andres had sulfur water.

Same operator's 1 Four Lakes, southwest of the Bough field, was drilling in dolomite at 7,522 ft.

In northwestern Lea County, H. S. Moss 1 State recovered salt water on a test at 9,910-10,001 ft. and was drilling ahead below 10,490 ft. Nearest production is the Bagley Hightower field.

Sharples Oil Co. 1 Seth Alston, wildcat southwest of Tatum, was drilling ahead below 12,318 ft. Last reported drill-stem test, at 11,163-303 ft., had gas in 3 hours estimated at 30,000 cu. ft. daily, and recovered 685 ft. of oil and gas-cut mud. The mud ranged from 20-50 per cent oil.

East of the Gladiola Devonian area, The Texas Co. 1 State recovered salt water on a 2½-hour test at 10,170-336 ft.

Tide Water Associated Oil Co. 1-D State, deep wildcat east of the Lovington area, plugged back to 12,130 ft. after testing in the Devonian from 12,519-75 ft. The tool was open 1 hour and 15 minutes, to recover 3,095 ft. of mud and slightly oil-cut salt water. One hour of swabbing recovered gas and approximately 1 bbl. of distillate.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Paul C. Teas 1 Bernice Dinnin, 24-20s-33e, TD 3,373 ft., Yates 3,260 ft., pumped ½ bbl. oil a day.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Chaves County: Earl G. Levick 1 Levick-State, 36-9s-26e, dry, TD 1,940 ft., elev. 3,849 ft., San Andres 1,328 ft.

Lea County: Ralph Lowe 2 Self, 7-26s-38e, dry, TD 3,980 ft., elev. 3,020 ft., Yates 2,660 ft., Seven Rivers 2,929 ft., Queen 3,470 ft.

Eastern Texas

New Area Deep Producer Indicated in Rains County

DALLAS. — A deep-producing record for East Texas was in prospect at R. J. Caraway 1 H. L. Puckett, J. R. Dyer Survey in Rains County. The well was flowing to clean, making gas and oil from a section between 11,964-12,126 ft., said to be the Buckner. Operators had placed the well on production through ¼-in. choke after washing the hole with fresh water and then swabbing in. There was no gage on production.

Located between Sandusky field and Howell & Howell's Ellenburger discovery to the southeast, H. F. Gibson 1 Webb, J. D. McLeod Survey, had flowing oil from the Ellenburger.

The well had top of the formation at 7,554 ft. and was drilled to 7,632 ft. A drill-stem test open 1 hour and 20 minutes had gas in 15 minutes and oil in 50 minutes. During the remainder of the test it flowed at an estimated rate of 15 bbl. hourly of 44°-gravity crude.

On the southeast side of Sandusky field, a development well in the Oil Creek pay, Kimbell-Sims 1 T. L. Miller completed for 126 bbl. of 42°-gravity oil in 12 hours. The flow was through 3/16-in. choke from pay at 7,162-83 ft.

The Texas Co. 2 M. A. Scarborough, north offset to its No. 1, topped the Oil Creek sand at 7,150 ft. and had 22 ft. of pay, with a shale streak in the middle.

In Anderson County, Continental Oil Co. was ready to complete its 1 Frank Carroll as a gas-distillate discovery. The well tested 54 bbl. of distillate along with 650,000 cu. ft. of gas per day through ⅛-in. choke, from the upper Rodessa section at 8,914-24 ft.

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Location is about 3 miles south of Tennessee Colony.

In Kaufman County, T. D. Humphrey 1 Fritz was waiting on dual-completion permit. Potential test through perforations at 6,223-39 ft., in the Rodessa, produced 467 bbl. of 40°-gravity oil a day through 12/64-in. choke. Gas-oil ratio was 191 cu. ft.

EAST TEXAS (DISTRICTS 5 AND 6) WILDCAT FAILURES

Cherokee County: M. G. Hansbro 1 J. H. Bolton, Widgeon Sur., 7 mi. SW Summerfield, dry, TD 9,100 ft., red beds 4,615 ft., Odom lime 5,115 ft., Paluxy 6,250 ft., upper Glen Rose 6,580-90 ft., Pettit 8,434 ft., Massive anhydrite 8,094 ft.

Ellis County: T. M. Nowlin, Jr. 3 T. W. Christian, H. W. Swisher Sur., 2 mi. NE Ellis, dry, TD 2,878 ft.

Falls County: Morris M. Perkins 1 D. C. Parter, J. A. Manchaca Sur., 3½ mi. NW Lott, dry, TD 1,105 ft.

Canadian Fields

Confirmation Well Extends Ellerslie Area Production

CALGARY.—Oil success appears apparent from the Lower Cretaceous at an outpost in the Ellerslie area of central Alberta. The new well is a ½-mile extension to C.P.R.L.-Ellerslie 1, Lower Cretaceous oil discovery drilled by Miller, Pyrcz & Roberts Oil Co., Ltd., on a half-section farmout from the Oliver Syndicate.

The second well is South Edmonton 1, in LSD 5, 32-51-24w4, ½ mile southeast of the discovery, about 3½ miles east northeast of Terra Petroleums' Viking sand Ellerslie oil discovery and the same distance northeast of Whitemud Cretaceous oil. The hole was carried to 3,900 ft., prior to drill-stem testing. The crew set packers above and below the pay zone (indicated by electrolog) from 3,838-48 ft., and a 1-hour drill-stem test was run of that interval. During the test, oil rose to within 10 ft. of the top of the hole, for an approximate 3,838-ft. column of oil. Production string of casing has been set at bottom 3,900 ft. and will be perforated for production.

Natural gas, rated over 1,500,000 cu. ft. daily, has been struck at another venture being drilled by Pacific Petroleums, Ltd., in the Peace River area of northwest Alberta, and testing is being continued. The new gas strike is Pacific-Valleyview 2, in LSD 16, 22-71-21w5, around 70 miles south of Peace River town, and 4½ miles north of Valleyview 1 well which showed gas at the rate of 3,040,000 cu. ft. daily during drill-stem test. alleyview 2 found its gas in the Peace River sands in tests from 2,805-22 ft. The first test was run from 2,805-17 ft., with maximum flow rate during 1-hour test being 1,600,000 cu. ft. daily. A second test, from 2,810-22 ft., gave gas at a 1,860,000-cu. ft. rate daily, with 1-hour pipe recovery of 30 ft. of muddy water.

Pump production testing is being continued at California-Standard Co.'s oil discovery well in the Virden area of southwestern Manitoba in an effort to fully evaluate the possibilities of commercial production. Meanwhile, the company's first follow-up of the discovery ran a series of swab tests, indicating that the well may have better prospects of being a commercial oil well than the discovery. However, water is present with the oil at both wells, and a final appraisal of the oil find cannot as yet be made.

The discovery well, Cal-Standard-Daly 15-18, in LSD 15, 18-10-27w1, is currently pumping at the rate of 8 bbl. of net oil daily. Water cut is running about 65 per cent. The discovery found its oil in a limestone section from 2,200-2,340 ft. Gravity of the crude is 33°. The second well, Cal-Standard-Daly 10-18, in LSD 10-18-27w1, a south offset to the discovery, during latest swabbing runs was making fluid at the rate of 2½ bbl. hourly. Water cut at this follow-up test is about 25 per cent. The crew is now waiting on pumping unit prior to running extended production tests for evaluation.

Albercan Oil Corp. has completed testing operations of several sands through a 216-ft. section of Cretaceous formation at a well in the Lone Rock sector of the Lloydminster "black oil" belt. The testing procedure, far more thorough than at most wells, brought interesting results: heavy crude oil, in indicated commercial volume, in two separate sands; dry gas, in substantial volume, in a third sand; a little gas, oil, and water in a fourth sand.

The well, Franco-Albercan 12-3, NW LSD 12, 22-47-27w3, is now being readied for production from the better oil sand, the Main Sparky sand at 1,848-56 ft. This sand, on bailing test, gave 16.1°-gravity oil at a rate of 144 bbl. per day. The well completed drilling at 1,951 ft. and set 7-in. casing at 1,940 ft. Then testing of the Cretaceous section started, by gun-perforation of the pipe opposite various sands. The G. P. sand at 1,885-88 ft., bailed 14.5°-gravity oil at 96 bbl. daily. The Main Sparky sand at 1,848-56 ft., bailed 144 bbl. daily of 16.1°-gravity oil. The lower Colony sand interval at 1,736-38 ft., on 1-hour drill-stem test, gave gas at the rate of 280,000 cu. ft. daily, plus pipe recovery of 400 ft. of salt water. The lower Colony sand at 1,728-30 ft., after squeeze-cementing of the lower part of the zone, produced "wet oil" of undetermined gravity. The middle Colony sand at 1,704-06 ft., produced dry gas. Open flow measurements showed 5,960,000 cu. ft. per day. After squeeze-cementing off this gas sand, the hole will be cleaned out to the second plug at 1,862 ft., and the Main Sparky sand interval will be placed on production.

CANADIAN SUCCESSFUL WILDCATS

Shell and B.A.-Bluesky 1, LSD 4, 29-81-1w6, TD 7,225 ft., 14,000,000 cu. ft. of natural gas daily.

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LSD 8, 5-62-23w4, TD 4,345 ft., natural gas in Viking and Lower Cretaceous sands.

CANADIAN WILDCAT FAILURES

Western-Duhamel 31-3, LSD 3, 31-45-21w4, TD 5,050 ft.

Pacific-Dunvegan 1, LSD 6, 17-81-4w6, TD 4,350 ft.

Stanolind-Meadowbrook 3, LSD 15, 33-63-24w4, TD 4,159 ft.

H.B.-Union-Salt Creek 1, LSD 12, 9-79-13w4, TD 6,606 ft.

California

Newhall Area Paces Exploration Work

LOS ANGELES.—Wildcatting in the general vicinity of Newhall, Los Angeles County, continues to be the highlight of California activity. With 14 tests under way within 12 miles or so from the town, one new discovery seems assured and shows were being tested in two others.

West of Placerita Canyon production, Talisman Oil Co. 1 Braille made a flow estimated at the rate of 75 bbl. of 20°-gravity crude daily. With 7-in. casing set at 3,150 ft., and 5⅞-in. liner landed at 3,196 ft., total depth, little water accompanied the oil flow. At last reports pumping equipment was being installed. The wildcat, located in Section 1-3n-16w, is a joint test with Continental Oil Co. and Macoil Corp.

At Bartholomaus Canyon, in Section 6-2n-14w, core analysis and electric logs revealed possibilities of 18°-gravity crude from a sand topped at about 1,600 ft. in the W. W. Bush 1 Bartholomaus Canyon. Last weekend it was standing with 7-in. casing set at 2,988 ft., total depth.

Further north, in Section 36-3n-15w, at Terminal Drilling Co. 1 Lloyd in Lopez Canyon, a drill-stem test between 2,550-2,653 ft. resulted in the recovery of almost 300 ft. of oily, gas-cut mud. At Paradise Ranch in Section 28-6n-17w, Castaic Oil Co. 1 Mary Austin cored a tight oil sand between 3,137-77 ft. A 45-minute etst of this interval resulted in a 425-ft. rise of oily, gas-cut mud.

In Section 29-4n-16w, about 1½ miles southeast of Humble Oil & Refining Co.'s extension to Castaic Junction field, General Exploration Co. has its 1 Newhall Land & Farming Co. under way. In Section 9-4n-16w and about 2½ miles southeast of Honor Rancho production, Humble was below 1,150 ft. at its D-1 Newhall Land. On the eastern edge of the field, in Section 1-4n-17w, the joint test of Humble and British-American Oil Producing Co. was drilling at 11,100 ft.

In San Joaquin Valley and about 25 miles north of Coalinga production in Fresno County, L. M. Lockhart was running 5½-in. casing in 1-31 England to test between 40-70 ft. of zone above 10,163 ft. Located in the Panoche Creek area, Section 31-14s-13e, after being drilled to 10,357 ft., the hole has been plugged back to the above depth.

Also in Fresno County, in the Curry Mountains about 2 miles southwest of Jacalitos field, Signal Oil & Gas Co. was preparing to whipstock and redrill its 1 Signal-Camino in Section 31-21s-15e. Drilled to a total depth of 5,589 ft., it was plugged back to 4,145 ft.

The San Ardo area of Monterey County, in the Salinas Valley of Coastal California, had a new discovery. The successful wildcat was Jergins Oil Co. 1 Aurignac, in Section 9-23s-10e, about 1 mile southwest of Los Lobos production. It was completed flowing 17 bbl. of 14°-gravity crude from a 3,400-ft. sand.

With four wells in the process of being completed, development of San Ardo field is being accelerated after a 2-year lull. Superior Oil Co. and The Texas Co. each have two rigs busy there and Jergins is moving in a second rig to speed up a 10-well drilling program.

CALIFORNIA WILDCAT FAILURES

Kern County, Southeast Edison area: United Exploration Co. 1 United-DiGiorgio-Bell, 36-30s-29e, dry, basement 2,397 ft., TD 2,410 ft., elev. 570 ft.

Tejon Hills area: Charles E. Phillips 1 F.P.K., 14-11n-18w, dry, TD 1,277 ft., elev. 1,163 ft.

Los Angeles County, South Oak Canyon area: Western Gulf Oil Co. 2 Foley, 5-4n-17w, dry, TD 1,288 ft., elev. 1,722 ft.

San Luis Obispo County, Cuyama Valley area: Richfield Oil Corp. 1 Priest, 34-11n-27w, dry, TD 8,407 ft., elev. 2,460 ft.

CALIFORNIA SUCCESSFUL WILDCATS

Kern County, North Antelope Hills area: ¼ mile northwest extension—The Texas Co. 1 Effie Martin, 14-27s-19e, on 6-hr. test pumped at the rate of 155 bbl. of 17.3°-gravity oil per day, perf. 2,439-2,517 ft., TD 2,543 ft., elev. 880 ft.

Monterey County: New field discovery about 1 mile sonthwest of Los Lobos production—Jergins Oil Co. 1 Aurignac, 9-23s-10e, flowed at the rate of 17 bbl. of 14°-gravity oil per day, through 30 ft. of perf. above 3,475 ft., TD 4,341 ft., elev. 837 ft.

Illinois-Ind.-Ky.

Production Spreads In Monroe City District

ILIANA EXPLORATION CO. has opened another producing area in the Monroe City district of Knox County, Indiana, where it has completed 1 Roark pumping 35 bbl. of oil per day natural from the district's Aux Vases pay zone at 1,440-45 ft. The new discovery, located in the SWc Militia Donation 63-2n-83, is 2 miles north of the townsite and about a mile east of nearest production in the Monroe City North pool.

The Monroe City West pool, in the area about 2 miles southwest of the townsite, also is getting another well and small extension where Huntington Oils, Inc., is testing its 1 Carter, Militia Donation 11-2n-9w, on the pump making about 35 bbl. of oil daily from McClosky lime at 1,535-39 ft. Pay zone has been opened with a total of 6,000 gal. of acid. In the same immediate area, Davis Lambert and J. Cline 3 Verne Junkins, Militia Donation 166, swabbed at the rate of 7 bbl. of oil per hour while cleaning out following a 20-qt. shot. Its pay zone, also in McClosky lime, is at 1,505-13 ft.

Calvert Drilling, Inc., and C. L. McMahon, Inc., 1 Keck Heirs, SE NW NE 18-7s-12w, 5 miles southeast of Mount Vernon, southern Posey County, Indiana, pumped at the rate of 170 bbl. per day natural to open a new McClosky lime pool. It is only ¾ mile northeast of the La Mott pool, but is more than 2 miles from any other McClosky production.

Simon Lebow 1 Mosely, C NE NE 2-M-30, a wildcat in the Pleasant Ridge-Maxwell area on the Daviess-Ohio County line, western Kentucky, has been put on the pump and is estimated good for 35 to 50 bbl. of oil daily. Production is from the Jett (Tar Springs) sand at 946-93 ft. The discovery is on the Daviess County side of the line, 2 miles southwest of Pleasant Ridge and 3 miles northwest of Burford. Pay zone was shot with 60 qt. of nitro.

Gulf Refining Co. 1 Warnecke, NE NE NW 6-2n-3w, discovery well of the recently opened pool adjacent the Frogtown townsite, 6 miles northwest of Carlyle, Clinton County, Illinois, has been plugged back from the Silurian lime pay zone in which it originally was completed, and with casing perforated at 1,194-1,205 ft. opposite McClosky lime, flowed 70 bbl. of oil in the first 12 hours. Its Silurian pay zone was at 2,171-2,217 ft. with bottom of the hole at 2,340 ft. Plug-back depth is 1,610 ft. Since its original completion in the latter pay, another well (W. C. McBride 1 Schroeder), a north offset, has been completed in the McClosky. There also is one other Silurian well (E. J. Goldschmidt and H. F. Robison 1 Jaske Community), located 12 miles southwest of the Gulf well.

ILLINOIS WILDCAT FAILURES

Clay County: A. J. Hammer 1 Theobold, SE NW SW 4-3n-5e, dry, TD 2,288 ft.

Coles County: Daex Oil Co. 1 Daugherty, NE SW NE 13-13n-10e, dry, TD 517 ft.

Edgar County: M. Granholm 1 Rudy, NE NW SW 7-13n-12w, dry, TD 974 ft.

Effingham County P. N. Wiggins 1 Genaust, C SW NE 18-7n-6e, dry, TD 5,000 ft.

Fayette County: Simpson Drilling Co. 1 Ballance, NE NE SW 11-4n-1w, dry, TD 1,528 ft.

Montgomery County: Carl Jensen 1 Mansholt, NE SE SW 7-7n-5w, dry, TD 745 ft.

INDIANA SUCCESSFUL WILDCATS

Clay County: Clark County Oil Research, Inc., 1 Long, SE SW SW 23-11n-7w, IP 15 bbl., Devonian 1,490-94 ft., TD 1,494 ft. (opens Saline City pool).

Knox County: W. G. R. Drilling Co. 1 Wampler, 330 ft. from SL and 990 ft. from EL Militia Donation 152-4n-8w, (NE NE NE SE Projected Section 33), IP 40 bbl., McClosky 1,382-84 ft., TD 1,384 ft. (opens Bicknell pool).

EASTERN KENTUCKY

Ashland.—In northeastern Floyd County and on waters of Johns Creek, Hoenig and Ashland's 1 James Fraley flowed 220 bbl. of clean oil in 42 hours after acidizing with 1,000 gal. The well is producing from the Big lime (Mississippian) formation at total depth of 1,598 ft.

In Section 3-Y-79, Dixie King Oil & Gas Co. 1 Wain Boggs, wildcat in central Greenup County, failed to find production in Corniferous lime to total depth of 1,180 ft., some 45 ft. in the formation, and were preparing to plug back preparatory to shooting Devonian black shale section for possible gas production.

In Fleming County, 20-V-70, Walter Kline et al., are still shut down at 1 James Bashford pending decision to deepen. The test is bottomed at 1,656 ft. in Knox dolomite topped at approximately 1,575 ft.

Development Contract O.K.'d

An oil-development contract with Manabi Exploration Co. has been approved by the Council of State of the Ecuadorean Government in Quito.

The contract provides that the company will not be subject to further taxation and that dollar exchange resulting from its Ecuadorean operations may be disposed of freely. Manabi *(The Oil and Gas Journal, December 21, 1950, page 270)*, holds concession rights over some 1,500,000 acres along the Ecuadorean coast and last year bought the properties of Ecuador Oilfields, Ltd., including about 1,700 bbl. daily of production.

Gas Deliveries Suspended

United Gas Pipe Line Co., Shreveport, La., has ceased deliveries of natural gas to Compania Mexicana de Gas, S. A., for use at Monterrey.

During 1950 the firm delivered 3,362,785 M.c.f. Contract under which the fuel was delivered was completed, and facilities have been sold. United Gas had been exporting gas to Mexico since December 4, 1929.

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ALTENS FOUNDRY & MACHINE WORKS, INC.
Lancaster, Ohio

Louisiana-Arkansas

Nevada County Gets Oil Strike

SHREVEPORT.—The State of Arkansas got its second oil discovery of the year when J. B. Warmack et al. 1 L. P. Weaver pumped from 10-40 bbl. of heavy black oil from the Nacatoch. The strike is located in Section 17-14s-21w, Nevada County, in Willisville town, some 5 miles southwest of Waterloo field which produces from the same sand. Rig is being moved to the same operator's 1 Eva Rogers, west offset to the discovery.

N. V. Kinsey's 1 C. M. Miller, 33-10s-24w, wildcat attempt to tap a shallow pay zone in Hempstead County, failed at a total depth of 1,934 ft.

A rank wildcat in Chicot County, J. Marvin et al. 1 Cox, 3-17s-1w, drilled to 3,620 ft. in igneous rock, and is taking sidewall cores after running log.

North Louisiana.—Two fields got good producers (one oil and one gas) the past week. In Benton field of Bossier Parish, Sunray Oil Corp. brought in its 18 Benton field unit for 431 bbl. of 36.7°-gravity oil per day. Located in Section 12-20n-13w, the well produced from open hole at 8,151-61 ft. Southern Natural Gas Co. dually completed a workover job in 3-16n-6w, Bear Creek field, Bienville Parish. There was an open flow gage of 30,000,000 cu. ft. of gas per day from the Pettit lime at 6,676-88 ft., and 24,000,000 cu. ft. of gas from the Hosston at 7,452-58 ft. Distillate recovery from the Hosston was approximately 2½ bbl. per million cubic feet.

In LaSalle Parish, Justiss-Mears Oil Co. had drilled its wildcat, B-1 Ward et al., 13-7n-3e, to a total depth of 4,201 ft. Operator ran 5½-in. producing string and is testing perforations at 4,005-09 ft.

Extension of Big Island field limits is indicated at Arthur Silberman 1 Beaubeouf, 4-4n-3e, Rapides Parish. Seven-inch casing has been set at total depth of 5,572 ft., for completion attempt after a drill-stem test of the Wilcox at 5,542-5,572 ft. recovered 1,820 ft. of oil and 40 ft. of brackish water.

T. L. James & Co. 1 F. B. King, Claiborne Parish exploratory well, cored a slight gas show at 9,292-9,342 ft. Spotted in Section 29-22n-5w, the test is drilling below 9,349 ft.

NORTH LOUISIANA WILDCAT FAILURE

Bossier Parish: Skelly Oil Co. 1 Ledbetter, C NW NE 7-18n-11w, dry, TD 5,750 ft., Nacatoch 1,027 ft., Saratoga 1,354 ft., base Annona 1,588 ft., Tokio 2,054 ft., Tuscaloosa 2,614 ft., Paluxy 2,658 ft., massive anhydrite 3,939 ft., base massive anhydrite 4,180 ft., Bloyd 4,425 (?) ft., Sligo 5,108 ft., Hosston 5,437 ft.

Venezuelan Operations Gain

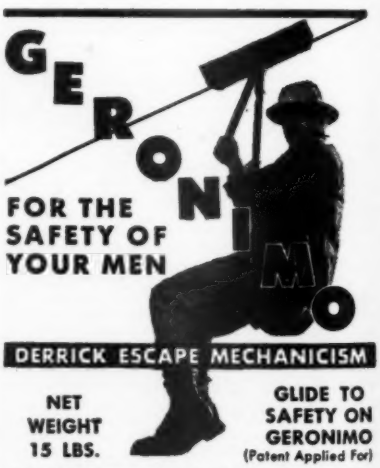
Production, refinery throughput, and drilling activity of Creole Petroleum Corp. in Venezuela all showed an increase in December over the previous month, according to the company's report.

Operated production averaged 689,753 bbl. daily against 683,874 bbl. daily in November. Net production and purchased royalty oil amounted to 732,085 bbl. daily in December. Refinery runs during the month were: Caripito, 63,894 bbl. daily; and Amuay, 68,927 bbl. daily.

In December, Creole operated an average of 9.9 rigs against 8 in November. Three exploratory wells were completed, one dry in East Maron and two successful, one in Maracaibo, and one in Quiriquire.

Have You Seen This Man?

He prowls all over East Texas, Arkansas, Louisiana and Mississippi — day and night. And, brother, that's considerable prowling even for Johnny Deaver! ★ What's he looking for? Come closer and we'll tell you — he's nosing out oil men who should be using Web Wilson Tongs, Elevators, Links and Hooks. His contention is that *every* rig should use 'em, and he is mighty convincing. ★ Maybe you've seen his face before, because after passing on the credit of oil operators (for a big supply store outfit) for *only 17 years*, he *suddenly* became convinced that they were *mighty fine folks*. And that he might as well sell 'em tools and let somebody else do the collecting. Clever, eh? ★ Maybe you ought to phone him at New Iberia, Louisiana 155.



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PERRY, OKLAHOMA

International

(Continued from page 71)
to maintain production in the Chauk area.

The company has been operating a topping plant of about 2,000 bbl. daily at Chauk. The plant has been providing about 40 per cent of the country's total requirements of products, including all Central and upper Burma's needs of motor fuel, kerosine, diesel, and furnace oil.

Japs Get Oil Control

Complete control over the civilian-petroleum supply in Japan has been restored to the Japanese Government by occupation authorities.

An announcement from General MacArthur's headquarters in Tokyo last week said controls heretofore exercised by occupation officials over allocation, distribution, rationing, and refining of petroleum products have been abolished.

The Japanese Government has been charged with responsibility of handling the petroleum supply but its actions have been subject to approval of General MacArthur's headquarters. Japan's main Pacific Coast refineries resumed operations last year after a 4-year shutdown.

In Tokyo, it was said the removal of occupation controls over petroleum supply would enable Japan to expand refining capacity at will. Plans already had been made to step up the imported-crude allocation to the refineries from 34,800 bbl. daily to 43,000 bbl. daily in April.

Japan Seeks Refinery Hike

Japan's Pacific Coast refineries are now operating on the basis of 33,000 bbl. daily throughput, and the government is negotiating with occupation authorities for an increase to 52,000 bbl. daily.

Occupation Headquarters recently approved quotas for the April-June and July-September quarters providing for 3,300,000 bbl. of crude in each period. This represents a daily average allotment of about 37,000 bbl.

Of the 3,300,000 bbl. for each of the two quarters, 2,800,000 bbl. will be imported from the dollar area, and the balance from sterling sources.

Japan's Pacific Coast refineries, which operate on imported oil and comprise the most important part of the country's refining industry as distinguished from the group of small field plants using domestically-produced crude, were shut down after the war and marked for possible reparations. After several surveys of the plants, some of which were badly damaged, a group of them were authorized by occupation officials to resume operations about a year ago.

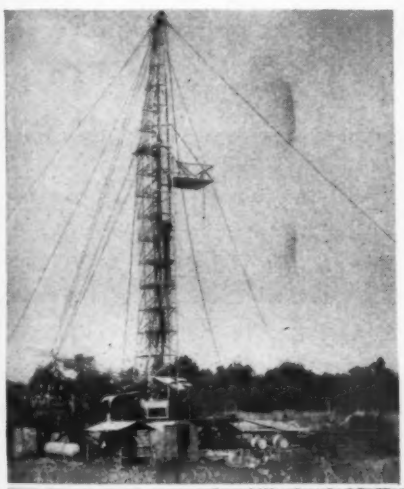
The move was made in an effort to assist the Japanese economy and relieve part of occupation costs resulting from importation of finished products. The main Pacific Coast refineries which were reactivated belong to Japanese companies which since the end of the war have affiliated with one of the three principal foreign marketing companies, Standard-Vacuum, Caltex, and Shell.

Present allotment of crude to Japanese refineries is as follows (in barrels daily):

Japan Petroleum Co.:	
Yokohama	4,000
Shimomatsu	3,750
Toa Fuel Co.:	
Shimizu	5,000
Wakayama	5,500
Maruzen Petroleum Co.:	
Shimotsu	4,750
Koa Petroleum Co.:	
Marifu	3,000
Mitsubishi Petroleum Co.:	
Kawasaki	3,000
Showa Petroleum Co.	4,000
Total	33,000

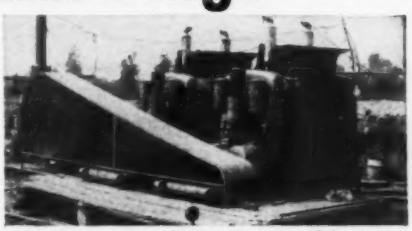
(Other international news will be found on pages 143, 144, and 157.)

Beene-Hurley Use Low Cost Power on Frank's Rig!

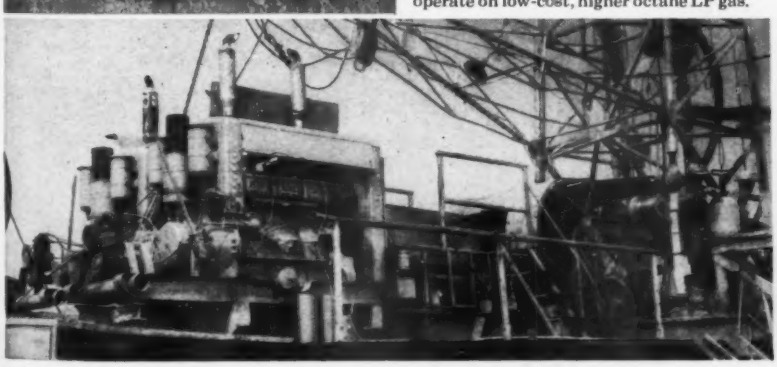


Drillers Beene and Hurley at Bossier City, La., use Frank's portable rig with four Minneapolis-Moline 1210-12A units for power. They are drilling low-cost wells to depths of 6500 feet. The 1210-12A, 12 cylinder unit engines are factory equipped to operate on LP gas or natural gas—the low priced fuels in this area.

Beene and Hurley have mounted two of these units on the drilling table to furnish power to the draw works. These engines are equipped with front power take-off drives and supply 400 hp with LP gas. The other 1210-12A units are remotely located on the mud pump. The complete engineering and installation was done by Beene and Hurley at Shreveport.



Mud pump installation is powered by two MM 1210-12A's.



Two MM 1210-12 on the drilling table operate on low-cost, higher octane LP gas.

This arrangement combines flexibility of layout with important time saving for setting up the rig. Precision tooling and high production methods account for the extremely low selling price of MM heavy-duty oil field power units. Standardization of parts permits interchangeability which assures easier, lower-cost maintenance.

Sales and service of MM oil field engines are handled by the Shrimpton Manufacturing and Supply Co., with branches at Los Angeles, California; Oklahoma City, Oklahoma; and Kilgore, Texas.

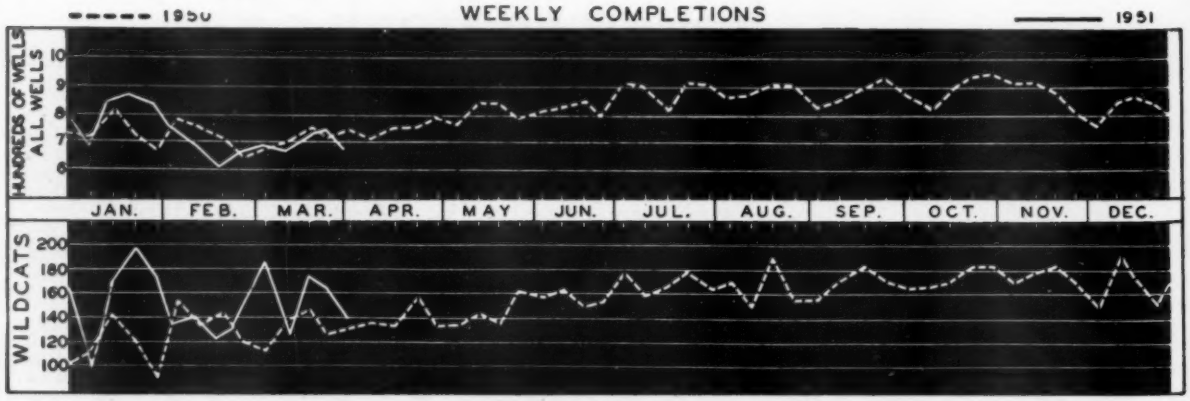
CURRENT STATISTICS

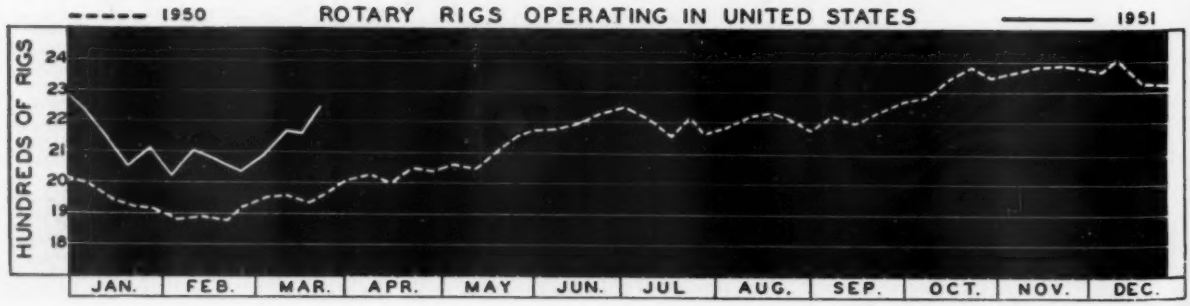
EXPLORATION

WEEKLY WELL COMPLETIONS . . . . WEEK ENDED MARCH 31, 1951

	Total of all wells					Mar. 31		Wildcat completions and discoveries										
													Cumulative total, 1951					
	Comp.	Oil	Gas	Dry	Footage	1951	1950	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	7	4	0	*3	10,192	97	145	0	0	0	0	0	0	0	0	0	0
Pennsylvania	21	8	4	†9	40,583	196	262	0	0	0	0	0	0	0	0	1	1
West Virginia	11	0	10	1	37,288	148	157	0	0	0	0	0	0	0	3	2	5
Ohio	24	6	6	‡12	49,170	¶199	223	0	0	0	2	2	1	0	2	¶8	¶11
Indiana	12	5	0	7	22,513	220	262	2	0	0	0	2	6	0	1	48	55
Kentucky	11	7	3	1	30,163	188	198	0	0	0	0	0	2	0	0	26	28
Illinois	16	2	0	§14	34,840	397	515	0	0	0	6	6	11	0	0	60	71
Michigan	15	7	0	8	38,335	163	180	0	0	0	5	5	3	0	3	63	69
Kansas	77	41	3	33	254,696	981	832	5	0	1	11	17	44	0	3	171	218
Nebraska	5	1	0	4	19,308	75	18	0	0	0	2	2	2	0	1	32	35
Oklahoma	86	53	0	33	305,371	1,302	1,199	3	0	0	10	13	49	1	7	164	221
Texas	290	168	17	105	1,277,151	3,905	3,852	11	1	3	61	76	155	17	26	701	899
North Central (Dist. 7-B & 9)	99	53	4	42	307,403	1,152	1,183	7	0	2	23	32	74	0	3	274	351
West (Dist. 7-C & 8)	73	54	0	19	373,033	1,179	1,129	0	0	0	10	10	31	4	0	146	181
Panhandle (Dist. 10)	15	6	6	3	46,932	179	273	0	0	0	1	1	0	0	0	6	6
Eastern (Dist. 5, 6, & 6-P)	18	14	0	4	80,478	262	265	0	0	0	3	3	0	0	0	51	51
Gulf Coast (Dist. 2 & 3)	42	18	3	21	269,183	571	519	2	1	1	13	17	29	9	18	107	163
Southwest (Dist. 1 & 4)	43	23	4	16	200,122	562	483	2	0	0	11	13	21	4	5	117	147
Louisiana	29	17	1	11	157,334	500	585	1	0	0	2	3	16	0	3	67	86
Northern	19	11	0	8	58,789	240	294	0	0	0	1	1	¶4	0	2	33	¶39
Southern	10	6	1	3	98,545	260	291	1	0	0	1	2	12	0	1	34	47
Arkansas	3	0	0	3	9,856	92	83	0	0	0	0	0	1	0	1	14	16
Mississippi	3	1	0	2	23,797	56	75	0	0	0	1	1	3	1	0	23	27
Southeastern States	0	0	0	0	0	13	15	0	0	0	0	0	0	0	0	2	2
Montana	0	0	0	0	0	38	30	0	0	0	0	0	0	0	0	7	7
Wyoming	13	11	0	2	55,951	166	138	1	0	0	1	2	4	0	0	24	28
Colorado-Utah	1	0	0	1	4,266	59	18	0	0	0	1	1	2	0	1	31	34
New Mexico	11	6	3	2	44,153	173	172	1	0	0	2	3	4	0	5	18	27
California	37	30	1	6	126,223	481	411	2	0	0	4	6	11	0	1	96	108
Miscellaneous (Md.)	1	0	1	0	4,031	11	3	0	0	1	0	1	0	0	6	5	11
Total United States	673	367	49	257	2,545,221	9,460	9,378	26	1	5	108	140	314	19	63	1,563	1,959
Total previous week¶	747	415	62	270	3,113,866	....	....	26	3	10	125	164	288	18	58	1,455	1,819
Total March 31, 1950	732	436	46	250	2,789,496	....	....	20	1	3	107	131	233	19	55	1,370	1,677

Service wells included: *3, †7, ‡2, §1. ¶Revised.





DAILY AVERAGE PRODUCTION FOR WEEK

	Mar. 31 crude oil	B. of M. Mar. demand	Mar. 24 crude oil
Alabama	2,700	2,400	2,800
Arkansas	79,100	88,000	78,950
California	965,900	970,000	966,800
Colorado	79,300	78,000	81,400
Eastern	58,050	66,000	61,225
Florida	1,500	1,600	1,550
Illinois	165,400	166,000	163,500
Indiana	27,200	31,000	27,200
Kansas	322,900	306,000	314,600
Kentucky	28,800	31,000	26,900
Louisiana	610,200	632,000	610,000
North Louisiana	114,200	.....	114,000
South Louisiana	496,000	.....	496,000
Michigan	41,200	45,000	38,900
Mississippi	98,600	114,000	98,500
Montana	24,300	23,000	23,700
Nebraska	10,100	8,000	10,400
New Mexico	141,000	140,000	141,000
Oklahoma	494,600	495,000	501,400
Texas	2,616,550	2,460,000	2,616,550
Dist. 1 (Southwest)	32,975	.....	32,975
Dist. 4 (Southwest)	244,150	.....	244,150
Dist. 2 (Gulf Coast)	157,100	.....	157,100
Dist. 3 (Gulf Coast)	463,900	.....	463,900
Dist. 5 (Eastern)	48,650	.....	48,650
Dist. 6 (Eastern)	105,725	.....	105,725
East Texas field	271,000	.....	271,000
Dist. 7-C (West)	84,950	.....	84,950
Dist. 8 (West)	892,500	.....	892,500
Dist. 7-B (W. Central)	79,200	.....	79,200
Dist. 9 (N. Central)	147,400	.....	147,400
Dist. 10 (Panhandle)	89,000	.....	89,000
Utah	3,700	5,000	3,700
Wyoming	197,200	183,000	193,900
Total United States	*5,968,300	5,845,000	5,962,975
Change from previous week, up	5,325		
Canada	74,980	.....	77,310
Total U. S. production January 1-March 31			†545,107,815 bbl.
Same period last year (crude plus cond.)			444,160,200 bbl.

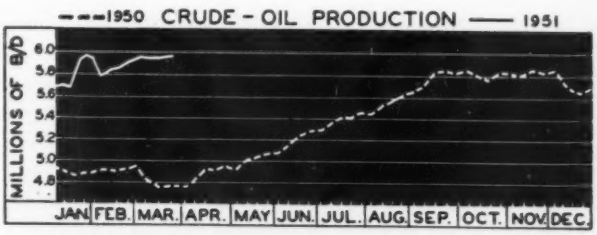
*Not including 109,300 bbl. condensate. †Including 9,549,435 bbl. condensate.

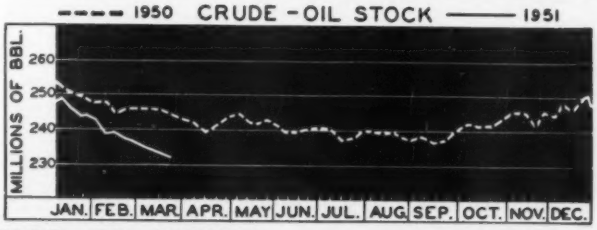
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

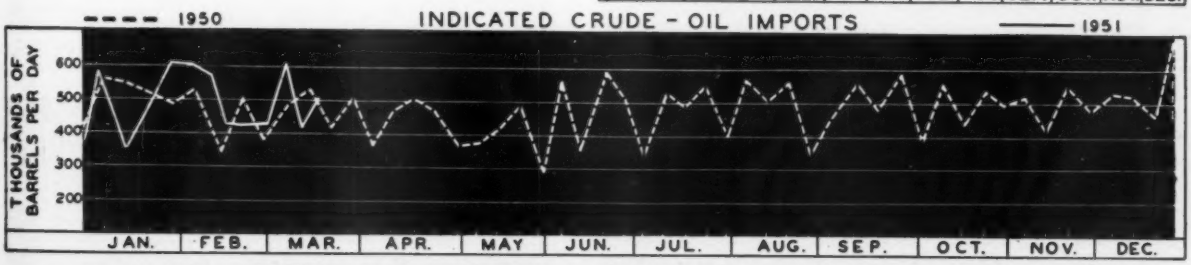
(Thousands of barrels)

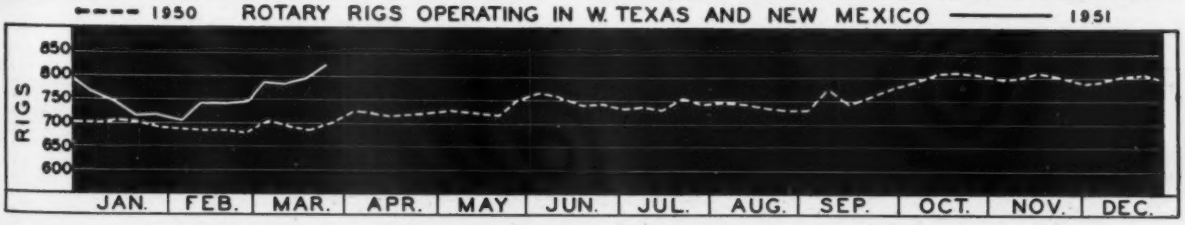
	Mar. 24, 1951	Mar. 17, 1951	Mar. 25, 1950
Pennsylvania Grade	2,030	2,034	2,738
Other Appalachian	1,092	1,081	1,582
Illinois, Indiana, Michigan	8,624	9,038	10,468
Arkansas	2,743	2,726	3,281
Louisiana	13,888	14,055	16,060
North	2,938	3,084	3,427
Gulf	10,950	10,971	12,633
Mississippi	2,788	2,844	2,594
New Mexico	7,087	7,155	6,805
Oklahoma and Kansas	37,081	37,096	35,408
Texas	109,308	108,820	106,687
East Texas	13,962	13,960	14,339
West Texas	44,155	43,393	37,645
Texas Gulf	23,509	24,438	28,311
Other Texas	27,682	27,029	26,392
Rocky Mountain	12,314	12,445	13,429
California	29,503	29,820	38,162
Foreign	6,374	6,001	7,013
Total	232,832	233,115	244,227

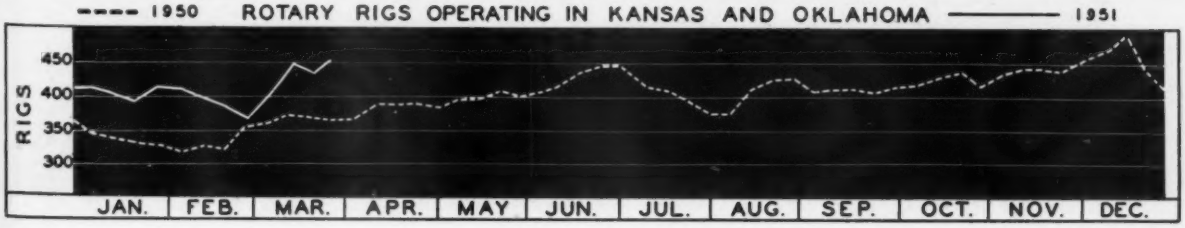
*Bureau of Mines.









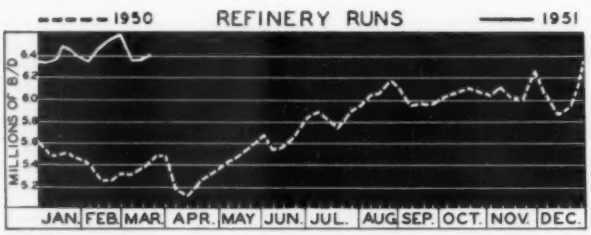


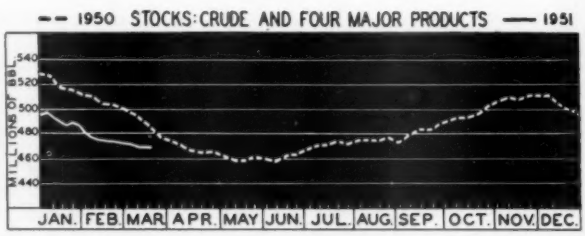
A.P.I. REFINERY REPORT, MARCH 24

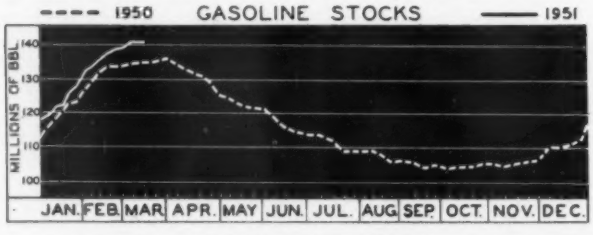
(Thousands of barrels)

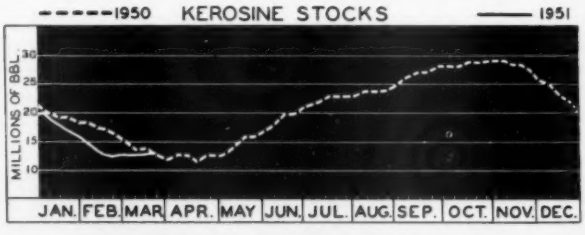
District—	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline†	Kerosine	Distillate	Residual	Bureau of Mines, March 1950: Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	978	348.8	41.7	220.3	241.3	27,339	5,464	12,523	8,363	810	330.6	30.2	182.6	204.3
Appalachian:														
District 1	109	42.9	8.9	11.6	13.0	2,833	221	478	274	91	40.1	7.6	13.3	10.4
District 2	77	35.9	4.6	13.6	21.4	1,374	75	186	136	69	29.9	4.5	11.3	18.3
Ind., Ill., Ky.	1,177	570.3	74.1	218.7	179.6	31,914	2,558	7,180	2,873	1,032	526.8	67.4	169.2	191.9
Okla., Kans., Mo.	505	274.8	17.1	121.8	73.4	16,167	521	5,431	986	426	235.8	18.2	89.4	54.4
Inland Texas	215	141.4	13.4	35.1	40.0	4,153	269	489	782	199	141.2	11.0	26.7	44.1
Texas Gulf Coast	1,554	676.6	131.3	370.7	276.0	23,227	1,705	5,611	4,442	1,234	579.0	102.6	209.4	216.9
La. Gulf Coast	507	243.0	67.1	119.9	69.6	8,421	1,150	2,002	1,695	431	209.3	56.6	92.7	50.3
N. La. and Ark.	60	22.7	5.4	7.3	9.0	2,609	256	808	71	64	25.8	6.8	12.8	13.6
Rocky Mountain:														
New Mexico	11	5.7	.....	2.3	2.3	86	25	58	30	12	6.3	0.4	1.9	2.9
Other Rocky Mtn.	259	102.0	7.0	41.4	44.0	5,799	252	1,301	647	170	79.5	6.1	32.0	35.7
California	966	397.0	3.4	116.0	419.0	17,317	536	7,559	17,028	798	334.5	14.4	96.4	311.0
March 24, 1951	6,418	2,861.1	374.1	1,278.7	1,388.6	141,239	13,032	43,626	37,327	5,336	2,538.8	325.8	937.7	1,153.8
March 17, 1951	6,401	2,905.9	375.4	1,256.0	1,353.3	141,007	13,084	44,966	37,753	.....	.....	.....	.....	.....
March 25, 1950	5,469	2,548.4	334.0	981.4	1,167.3	135,406	12,950	40,086	42,546	.....	.....	.....	.....	.....

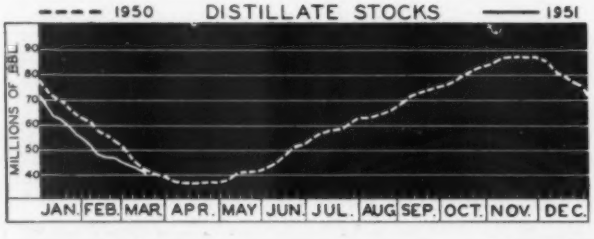
*At refineries including natural blended. †Finished and unfinished.

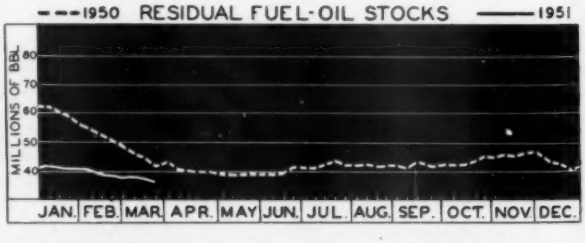


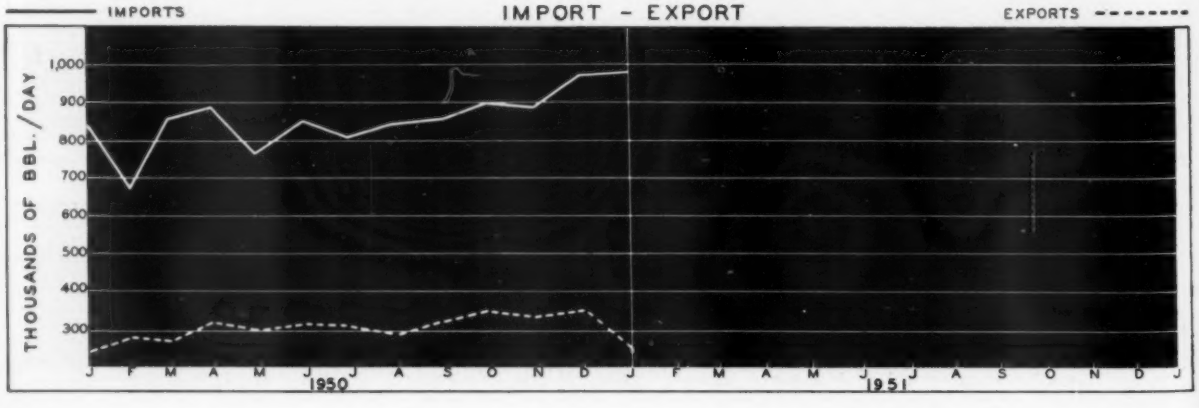












CRUDE PRICES
GRAVITY SCHEDULE

	Signal Hill, Calif.‡	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.93	....	....	....
19-19.9	1.98	....	....	....
20-20.9	2.03	$2.25	....	$2.12
21-21.9	2.07	2.27	....	2.14
22-22.9	2.12	2.29	....	2.16
23-23.9	2.18	2.31	....	2.18
24-24.9	2.24	2.33	$2.56	2.20
25-25.9	2.30	2.35	2.58	2.22
26-26.9	2.36	2.37	2.60	2.24
27-27.9	2.41	2.39	2.62	2.26
28-28.9	2.46	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.57	2.45	2.68	2.32
31-31.9	2.62	2.47	2.70	2.34
32-32.9	2.68	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.80
Beauregard Parish	2.80
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	4.25
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

REPORTS from the East Coast market area indicate that the out-of-balance price structure for residual fuel on the East Coast is getting some needed attention. Heavy-fuel prices, particularly in this area, were caught in a squeeze between ceilings set by the Office of Price Stabilization and increasing costs. The major cost increase has been from higher tanker rates.

Questionnaires have been sent to East Coast suppliers by OPS requesting information on increased costs of residual fuel for East Coast markets. A major oil company has filed a formal application with OPS for an increase in ceiling prices in the eastern area.

The average price of run-of-the-mine bituminous coal in New York Harbor is about $10.07 a ton, equivalent to a price of slightly more than $2.30 a barrel for residual on a B.t.u. basis. The posted price for residual is $2.15 a barrel with all sales at that price to regular customers. Bids up to $2.60 a barrel are reported for the open market.

The last advance in the harbor residual price was in July 1950 when postings went from $2.05 to $2.15 a barrel based on a Gulf Coast price of $1.75 and transportation costs ranging from 25 cents to 35 cents a barrel. Spot tanker rates increased to 200 per cent over the Maritime Commission base or to about $1.30 a barrel for heavy fuel but have dropped slightly within the past few weeks to MC base plus 140 per cent. A rate of MC base plus 25 per cent or 55 cents a barrel for residual was set recently for movement of military cargoes by the voluntary defense tanker pool. Even if average tanker rates could be lowered to this level, the New York Harbor posted price would have to be raised about 30 cents a barrel to provide a normal allowance of 15 cents for cargo buyers, based on the Gulf Coast low posting of $1.75.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of April 2, 1951. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅛-10½	12-12.75	10¾-11
Premium gasoline, 86-88 octane	11⅛-11½	13.5-13.75	11½-12
#2-44 w.w. kerosine	9¼-9⅜	10-10.1	8¾-9
No. 2 straw fuel oil	8¼-8⅜	9-9.25	7¾-8
No 6 residual	$1.80-1.90	$2.25-2.30	$1.75-1.90

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	6⅜	5⅞	6⅛
Grade 18-55	7.65	7.15	7.40

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	13-13.5
750 vis., No. 3-4 neutral	16
2 000 No. 5-6 neutral	18-19

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	29-30
200 vis., No. 3 neutral, 0-10 pp.	17.5-18.5

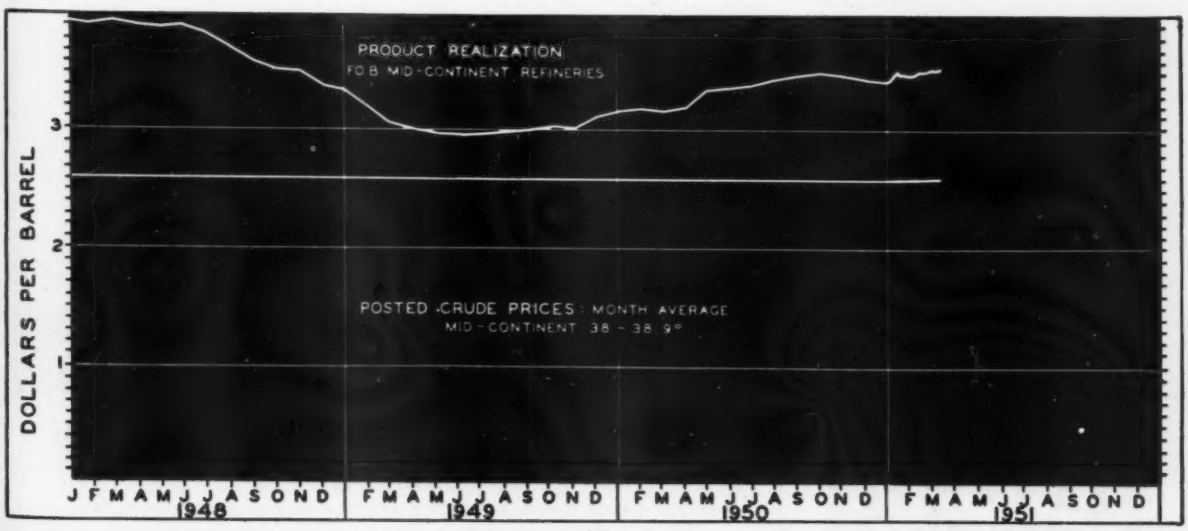
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	32.5
180 vis., 0 p.t. neutral	31.5

WAX

Mid-Continent

132-134 A.M.P.	6.0

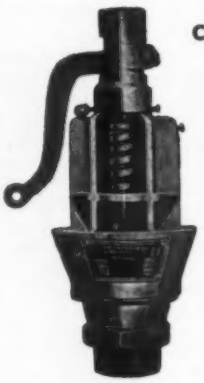

PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
DOLLARS PER BARREL
3
2
1
J F M A M J J A S O N D
1948
F M A M J J A S O N D
1949
F M A M J J A S O N D
1950
F M A M J J A S O N D
1951

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.54 for week ended March 24, $3.52 for previous week, and $3.22 for March 1950.

High Capacities for **SAFETY**

CARRY 2" SAFETY "POP" VALVES – SEVERAL DIFFERENT STYLES

For STEAM to 350 lbs.–450° F.
For OIL-WATER-GAS to 1000 lbs.



(Net Wt. 19 lbs.)
Style HC-TOES-A
(High Capacity-Top Outlet Exposed Spring) diffuses steam upward, but AWAY from the spring. 2" male inlet.

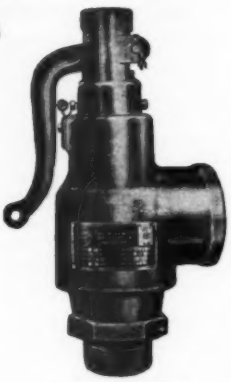
Minimum Blowdown — The safety or relief valve that will relieve the least pressure after opening is the most economical. All INFERNO valves are set with the lowest blowdown permitted by the A.S.M.E. Code.

Levers — The levers on all INFERNO safety valves are reversible, to make them convenient to pull, and pull cables are furnished with them. Easily popped valves are tested more frequently.

Stems — All stems are of Stainless Steel.

Tough Malleable Iron Bodies — have a tensile strength approaching that of steel — from 55,000 to 60,000 lbs. per square inch. They withstand rough treatment.

Valves and Seats — are of nickel alloy for pressures of 200 lbs. or above, and bronze for lower pressures.



(Net Wt. 15 lbs.)
Style HC-SOCS
(High Capacity-Side Outlet Closed Spring) 2" male inlet, 2½" female Outlet. For use where steam must be piped away.

INFERNO High Capacity Safety "Pop" Valves meet all A.S.M.E. Code requirements of the National Board of Boiler and Pressure Vessel Inspectors. Springs are of the highest quality spring steel available, and are low stressed for long life. All INFERNO Safety Valves are guaranteed without time limit as to defects in material and workmanship. Write today for FREE copy of Bulletin 11E for full information. Sold through all leading supply stores.

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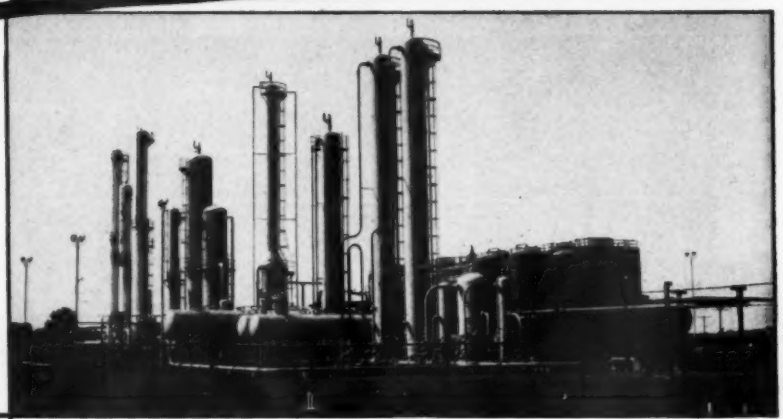
SHREVEPORT, LA., U.S.A.

PREVENTIVE MAINTENANCE IS ESSENTIAL TODAY!

CONTROL SCALE and CORROSION in ENGINE JACKETS, COMPRESSORS, COOLING TOWERS — Wherever Water Is Used

Now, more than ever before, it is necessary to increase the efficiency and life of equipment by maintaining scale-and-corrosion-free water-side surfaces. Wright Chemical Engineers can solve your water-conditioning problems quickly and economically.



Wright CHEMICALS

WRIGHT CHEMICAL CORPORATION

Specializing in Water Conditioning

GENERAL OFFICE AND LABORATORY 615 West Lake Street, Chicago 6, Illinois

OFFICES IN PRINCIPAL CITIES

Sole Distributor of Nelson Chemical Proportioning Pumps

EQUIPMENT MEN . . . in the News

BS&B to Be Represented By Five Additional Firms

Black, Sivalls & Bryson, Inc., announce the establishment of the following firms as representatives of B.S.&B. safety heads: Equipment Service Co., Inc., Birmingham; F. J. Doyle, James G. Nichols Co., Atlanta; W. D. Simons, Jr., Mec-Tric Control Co., Charlotte, N. C.; Specialty Sales Co., Salt Lake City; and W. M. Ross and C. J. Gaskell, C. J. Gaskell Co., Inc., Memphis.

Williams Made Sales Manager by Dowell

G. F. WILLIAMS

Guy F. Williams of Tulsa, has been promoted from assistant sales manager to sales manager, oil-field-products division of Dowell Incorporated, according to an announcement by R. D. Shaw, general sales manager. Williams, who has been with Dowell since 1936, was named assistant sales manager in 1946. He has been located in Tulsa since 1947 working with product sales.

Before coming to Tulsa, Williams served with Dowell as a treating engineer in Mount Pleasant, Mich., Seminole, Okla., and Great Bend, Kans.

Dowell is a Tulsa firm engaged in the application of chemical services to the petroleum industry.

Wheatley Expands Service With Two New Branches

Better to meet the needs of the growing oil and gas industry, Charles Wheatley Co., established in Tulsa in 1943, is opening branches with complete stocks of merchandise at Shreveport and Oklahoma City. It is also opening a sales office at Houston and a warehouse at Odessa, Tex.

Huber Dye, sales manager, announced that W. E. Wagner, who has been with the firm for 4 years, will manage the Oklahoma City branch, with Dick Hellinghausen in charge of the warehouse.

The Shreveport branch will be under the management of Harry (Dutch) Richardson, recently of the W. L. Somner Co. Richardson had been with United Gas Co. for 17 years and is a recognized authority in the field of valves and pumps.

Houston sales office will be in charge of Tim Kirk, formerly with Frank Wheatley Co. The Odessa warehouse stocks will be in the Texas warehouse. U. R. (Hack) Hackenjos, formerly with Empire Machinery Co., will be in charge.

Fogle to Head Industrial Field for Longhorn

H. P. Fogle became associated with Longhorn Supply Co., Houston, on March 1.

Longhorn is expanding into the industrial supply field, and Fogle will manage this phase of the new business. Fogle was formerly employed by Oil Well Supply Co. He was located in Southwest Texas from 1935 to 1944 as store manager and district manager, moving to Houston in 1944 where he served as assistant manager of the Gulf Coast division until 1949. He was employed by Standard Pipeprotection, Inc., St. Louis, from August 1949 until February 1951.

Ellsworth Made West Coast Manager by Geophysical

T. P. ELLSWORTH

T. P. (Ted) Ellsworth, formerly chief geophysicist of Richfield Oil Corp., was recently appointed manager of the West Coast division of Geophysical Service, Inc., Bakersfield, Calif. R. C. Dunlap, Jr., vice president of Geophysical Service, will be transferred shortly to the main office in Dallas, Tex.

A graduate of the Sheffield Scientific School of Yale University in 1930 with a B.S. degree in industrial engineering, Ellsworth was formerly a civil engineer with the New Haven Railroad. He entered the geophysical field with Western Geophysical Co. in California, serving in various capacities until 1943 when he was given the post of chief geophysicist with Richfield. While with that organization he directed geophysical exploration in Texas, New Mexico, and California, concluding with the recent intensive campaign in the Cuyama Valley.

Applebaum Heads Cochrane Water Treatment Division

Cochrane Corp., Philadelphia, Pa., manufacturer of water-conditioning equipment and steam specialties, has announced the appointment of S. B. Applebaum as manager of its water - treatment division. Applebaum, who has specialized in water conditioning for more than 35 years, joined Cochrane in 1949, since which time he has been manager of the cold-process section of the water-treatment division. He was founder and vice president of Liquid Conditioning Corp., now a subsidiary of Cochrane.

Hudson Appointed Safety Supervisor by Southern

JOHN HUDSON

Announcement has been made by Dr. Sidon Harris, president of Southern Geophysical Co., of the appointment of John Hudson as personnel and safety supervisor of Southern in Fort Worth with seismic survey crews throughout the Southwest, Mid-Continent, and Gulf Coast areas.

Hudson will direct the recruiting program for Southern's 14 crews and Fort Worth and Midland offices. A continuing program of safety for the benefit of Southern's employes and clients is a definite part of the company's policy.

Educated at University of Texas and West Texas Military Academy, Hudson has been in the oil industry for the past 20 years throughout the Mid-Continent, West Coast, and Mexico areas. His company affiliations were General Petroleum Corp. of Los Angeles and Standard Oil Co. of New Jersey.

Union Wire Rope Corp. to Hike Output 66 Per Cent

Union Wire Rope Corp. will spend 2 million dollars in expansion of its plant at Kansas City which will increase its space and pay roll 25 per cent.

M. G. Ensinger, president and gen-

eral manager, said part of the space will be for equipment and facilities which will increase the wire-mill output by 66 per cent.

Five major building projects, plus one which only recently has been completed and occupied, will add a total of 109,000 sq. ft. They will give Union Wire Rope more than 500,000 sq. ft. under roof.

Office Building Planned By Ray and Pollard

Robert H. Ray and Jack C. Pollard, partners in Robert H. Ray Co., exploration firm, have made plans for a three-story office building at the northeast corner of Fannin and Bremond, Dallas, contingent upon approval by the National Production Authority.

International Nickel Announces Appointments

Dr. John F. Thompson, president of International Nickel Co. of Canada, Ltd., has been elected to the additional office of chairman of the board of directors, succeeding the late Robert C. Stanley.

Dr. Paul D. Merica, executive vice president and a director, was elected a member of both the executive committee and the advisory committee of the company.

Thompson joined the company in 1906 as metallurgist to design and operate the company's first research laboratory. Later he established and became manager of the first technical department, which was a forerunner of International Nickel's present development and research division. Becoming manager of operations in 1921, he was elected assistant to the president in 1928, and was made a director and a member of the executive committee in 1931, a vice president in 1932, executive vice president in 1936, and a member of the advisory committee in 1937. Thompson succeeded Stanley as president in February 1949.

Republic Steel to Build Tube Mill at Chicago

Plans have been announced for the construction of a seamless tube mill at the South Chicago works of Republic Steel Corp. Work on the project will begin immediately and the first production is expected by April 1952.

The mill will enable Republic to produce in excess of 150,000 tons of seamless tubular goods per year. Sizes for 2⅜ to 9⅝ in. will be produced.

Some of the production of the mill will go into oil-country casing and tubing for oil wells 10,000 ft. and deeper, pipe for high-temperature and high-pressure service, and refinery still tubes.

Johnson Joins Sales Staff Of Bigelow-Liptak Corp.

Bigelow-Liptak Corp., manufacturer of industrial furnace enclosures, has announced that Victor P. Johnson has joined its sales staff. Because of his former work with Kellogg Co. in New York City, Johnson is widely known by oil-refinery and power engineers throughout the country. He will work out of Bigelow-Liptak's direct sales and engineering offices in New York City.

Hough Names Four New Representatives

The Charles N. Hough Manufacturing Co., Franklin, Pa., and Tulsa, has announced that A. D. Daniel will represent the company in southern Illinois, Indiana, and Kentucky, with headquarters in Salem, Ill. Fred S. Dewel, with headquarters in Casper, Wyo., will represent Hough in the Rocky Mountain area. Lee Long and Bob Wilson, both of Hobbs, N. M., will represent the company in West Texas and the State of New Mexico.

Induflux Opens Offices In Oklahoma City

Induflux Testing Service, Los Angeles, which specializes in testing sucker rods to determine points of fatigue and cracks, has opened offices at Oklahoma City with Jack Mott as district manager. Assisting him is John Goeschl. The offices will cover only Oklahoma activity for the time being.

D+B Division of Emsco Holds Annual Sales Meeting

With field men and district managers present from 14 Mid-Continent and Rocky Mountain states and executives from the West Coast and Texas, the D+B Division of Emsco Derrick & Equipment Co. held a 2-day annual sales meeting in Houston March 15 and 16.

William C. (Bill) Kinder, vice president in charge of the D+B Division, in opening the meeting declared the company's sucker-rod and deep-well-pump sales in 1950 had been the greatest in its history, which covers more than 30 years.

While D+B operates many of its own stores in the United States, the bulk of its products are sold domestically and in export by The Continental Supply Co. Many representatives of the latter company were on hand for the meeting. They included N. A. Endicott, vice president in charge of the Gulf Coast division; J. A. Mussler, general sales manager; C. A. Swanson, director of purchases; and E. M. Fetzer, manager production equipment division, Dallas.

Other D+B and Emsco executives present were W. T. Powell, vice president in charge of engineering and manufacturing; L. G. Evans, chief engineer of the D+B Division; G. W. Whitney, chief metallurgist; and L. M. (Tiny) Bush, California sales manager, all from the West Coast; F. L. Prosser, Mid-Continent manager of the D+B Division; G. H. Lewis, Mid-Continent sales manager; and J. G. Hast, plant superintendent, all from Garland.

Examining the new D+B sucker-rod brochure are: F. L. Prosser, manager, Mid-Continent division; W. C. (Bill) Kinder, vice president; J. G. Hast, plant superintendent, and G. H. Lewis, manager, Mid-Continent sales.

Field men and sales manager from 14 Mid-Continent states and California and executives of the D+B Division of Emsco Derrick & Equipment Co. are shown here at annual sales meeting held at the Shamrock Hotel. Present also were executives from Continental Supply Co.

Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY... CLASSIFIED ADVERTISING

UNDISPLAYED CLASSIFIED 12c a word one issue. 10% Discount three or more issues. $3.00 minimum charge. Blind Box in our care counts nine words. Payable in Advance.

DISPLAY CLASSIFIED
$12.00 a column inch one issue . . .
10% Discount three or more issues.

USED ROTARY AND CABLE TOOL DRILLING TOOLS, WIRE LINES, E. A. KELLY, BOX 861, OKLAHOMA CITY. PHONE 5-6407.

EQUIPMENT FOR SALE

FOR SALE: 7500 foot drilling rig, Houston Portable, fully equipped and ready to go. Just completed 7500 foot hole. Standard or Emsco jack knife derrick optional. Two pumps, one 7¼x14 and 7¾x18. Will have to see this equipment to appreciate. Write or call for appointment. 525 Wichita National Bank Building, Wichita Falls, Tex. Telephone 9300.

FOR SALE: Model 32 Special Walker-Neer spudder in A 1 condition. If interested call or write I. Weiner, P. O. Box 1224, Big Spring, Texas, or phone 1438, Big Spring, Texas.

1—3,000 GPM Fluor Atmospheric Tower, Model 23-A-15, California redwood; brass bolts, nuts and washers; copper nails; two distribution systems. Good condition. 1—Worthington pump, 1,500 gpm @ 30 ft. TDH, 1,800 rpm on base with 30 HP GE Motor. 1—Worthington pump, 800 gpm @ 110 ft. TDH, 1,750 rpm on base with 50 HP Motor. 1—Gould pump, 1,200 gpm @ 70 ft. TDH, 1,175 rpm on base with 35 HP Valley Electric Corp. Motor. 1—Ingersoll-Rand pump, 3,000 gpm @ 72 ft. TDH, 1,175 rpm with 100 HP Westinghouse Motor. All equipment available in May, 1951. Will sell all as a unit or separately. Located at 1100 East 21st Street, Wichita, Kansas. Derby Oil Company, P. O. Box 1030, Wichita, Kansas.

100 Tons

NAPALM

Attractively Priced

M. A. MIDDLEMAN
129 Pearl St., New York 5, N. Y.

Babcock and Wilcox Boilers

Water Tube Type

5—400 HP

2—320 HP

1—500 HP

These are double front and back boilers, two drum gas or oil fired straight tube sectional header type. All are 150 pound pressure, recently inspected and are in good condition.

For further information or inspection—

Write—Wire—Phone

SONKEN-GALAMBA CORP.
2nd and Riverview (K-700)
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THatcher 9243

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: In Kansas, 3—6″ x 6″ x 38′ and 46′ long rotary kelleys. $200.00 each. Cities Service Oil, Patridge, Bartlesville, Oklahoma.

FOR SALE: New International Tandem Axle Truck Model LF-192, Headache Rack, Tulsa Winch and Fifth Wheel Mounting; New Biltwell Tandem Axle Float and New Biltwell Tandem Axle Pole Trailer with fifth wheel connections and accessories. Actual Mileage 5426; Glen C. Shaw, 3312 N. Virginia, Phone 58-6196 or 3-3421, Okla. City, Okla.

FOR SALE
NEW OIL WELL CASING & TUBING
Various sizes, steady supplies,
Prompt Delivery.
Wire or Write
Box D-953, The Oil and Gas Journal, Tulsa, Oklahoma

EQUIPMENT FOR SALE

FOR SALE: Galvanized Iron Pipe, diameters 1½″ through 3″ length 30″ through 88″ threaded for fill pipes or suction stubs for Gasoline Tanks. Armco Drainage & Metal Products, Inc., P. O. Box 1343, Atlanta 1, Georgia.

1″ Jones No. 7 SUCKER ROD

(3300 Feet)

Used once 3 days to take potential. Located Winfield, Kansas. Price 60c per foot.

Call: FRED M. WARDEN
4-9100, Tulsa, Oklahoma

PIPE—TUBING—CASING

Order Now—Immediate Delivery!

SEAMLESS TUBING—EXCELLENT FOR GAS, OIL, WATER FLOW LINES

Quantity	Size	Approx. wall	Description
75,000′	1½″ O.D.	.140″	Recond. Seamless Tubing, P.E., 14′ & Over.
25,000′	2¼″ O.D.	.140″	Recond. Seamless Tubing, P.E., 14′ & Over.
100,000′	4″ O.D.	.140/.160″	Recond. Seamless Tubing, P.E., 14′ & Over.
75,000′	5 5/12″ O.D.	.258″	14.6# Lapweld, Beveled Ends, 20′ Random Mill Lengths.

TUBING & CASING

50,000′	2⅜″ O.D.	.....	4# Good Used Lapweld, Range 1 Tubing with New 11½ V-Threads and Collars.
25,000′	5½″ O.D.	.....	15½# Good Used Lapweld T&C, Range 1 Casing.
15,000′	7″ O.D.	.....	17# Good Used Lapweld, Range 1 T&C Casing. 11½ V-Threads.
3,000′	8⅝″ O.D.	.....	25# Good Recond. Casing, T&C, 8 V-Threads Range 1.
1,600′	10¾″ O.D.	.....	32.75# Good Used Lapweld T&C Casing, Range 1, New 8 Rd. Thds. & 8″ Long Collars.

THIS MATERIAL IS AVAILABLE FOR IMMEDIATE SHIPMENT, SUBJECT TO PRIOR SALE.

OTHER SIZES OF LINE PIPE, SEAMLESS TUBING IN SUITABLE SUBSTITUTE SIZES FOR STANDARD PIPE (EXCELLENT FOR GAS, GATHERING AND FLOW LINES), CASING AND TUBING AVAILABLE FOR IMMEDIATE DELIVERY.

FOR FURTHER INFORMATION, WIRE OR PHONE AT ONCE

A. J. STRUBEL, Broker

SIDney 1791 (Day Phone) HUDson 8152 (Night Phone) 4946 Murdoch, St. Louis, Mo.

EQUIPMENT FOR SALE

FOR SALE near Seminole, Oklahoma, one Braun, Size G portable distillation unit complete, Serial #7190, located in 24' x 40'-x18' Stefco steel frame sectional steel building. Price $10,000—Cities Service Oil Co.—Patridge—Bartlesville, Oklahoma.

OFFER FOR QUICK SALE
500 Standard 4-Inch
CAST IRON FLANGES
* *
2½ Gal. All Brass
FOAM FIRE EXTINGUISHERS
Morton I. Glass
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Kansas City, Mo.

EQUIPMENT FOR SALE

FOR SALE: One Houston Portable Rotary Drilling Rig complete. Excellent condition, ready to drill wells up to 6000 Ft. Two strings Drill Pipe. Contact H. H. Blair, 660 Bitting Building, Wichita 2, Kansas. Telephone #7-3241.

FOR SALE near Madison, Kansas, 2 band wheel and one geared pumping powers complete. Cities Service Oil Patride—Bartlesville.

ROTARY, used, 17" table, positive clutch, drive bushings, complete with 30' x 5" Kelly, #4 OWS swivel—$1100. Ideal 4-sheave 13" traveling block—$200. National 5-sheave 36" crown block—$325. Good used 4½ and 3½ drill pipe. Pressey & Son, Pueblo, Colorado.

EQUIPMENT FOR SALE

FOR SALE: 17½" Oilbath Gumbo Buster Rotary Table. 2—6" Gumbo Buster Swivels. Melton Supply Company, Seminole, Oklahoma.

GOOD BUY—8" COLLARS
28#, Line Pipe Couplings
Oilton Pipe & Supply Co., Oilton, Okla.

FOR SALE: Three 1946 F. W. D. (4 Wheel Drive) Tractors. All in good condition. Low mileage. One having only 7,622 miles. Will sell cheap and will deliver. Write Heintzelman's, Inc., Box 3071, Orlando, Florida, or phone "Bob" at 3-3477 collect, Orlando, Florida.

USED DRILLING AND PRODUCTION EQUIPMENT. GENERAL EQUIPMENT CO., 815 DANIEL BLDG. PHONE 2-6272, TULSA.

FOR SALE: Approx. 3000'—5½" OD, 20#, 8 RT, J-55, Range 2 Seamless casing, new collars and threads. 3300'—2" upset H-40, 8 RT, Range 2, seamless tubing, new. 3300'—4" OD 15.70# Pittsburgh seamless drill pipe, range 2 with Hughes Flash Weld, Full Hole Tool Joints. Pipe only made 33,000 ft. hole in Panhandle Texas since new. All types Boilers for sale. Phone 3957, Box 1517, Pampa, Texas.

Gaso Duplex 4½" x 6" Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units.

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 132—Rockdale, Texas
AT-3427—Houston, Texas

PRESSURE VESSELS

Quantity	Description—	Estimated working pressure
1	4' x 40' x 4" Forged Seamless	2,250
1	10' Dia. x 32-0" 1.75" shell-head 1.80" bottom-head 1.84" with series 30 outlets elliptical-heads, fusion welded construction	320
1	5' x 28' x 1" Riveted	250
1	6' x 35' x 1" Riveted and Welded	230
1	10' x 30' x 7/8" Riveted and Welded	120
2	9' 2" x 39' x 1 7/16" Riveted and Welded	221
2	4' 6" x 8' x 3/8" new-fusion code welded U-69-650° T	60
1	10-0 x 39-9 x 11/16" x 1" HDs.—Riveted—3 Trays w/63 C.I. Bubble caps/tray—3 Baffle plates rated 750° F	75
1	10-0 x 52-6 x 11/16" th x 1" Hds. Riveted—16 trays w/63 C.I. Bubble caps/Tray rated @ 750° F	75
1	5-0 x 44-7 x 3/8" Vacuum Tower w/11 Trays—new	175
1	6-0 x 28-0 x 3/8" Riveted—16 trays, spacing 16"	30
1	5-0 x 12-6 x 1/8" Riveted & Welded, 5 Trays—spacing 20"	100
1	5-0 x 30-0 x 3/8" Riveted & Welded w/Tulsa type mist extractor 10 trays—spacing 20"	120
1	3-6 x 50-0 x ½" th Riveted & Welded—4 trays w/16" spacing; 2-4 x 10-0 condenser on top	200

All Vessels Located in Our Yard in Kansas City and Offered Subject to Prior Sale

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Phone HA. 1000 P. O. Box 78 Zone 10
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COMPLETE DRILLING RIGS FOR SALE

1. **NATIONAL 50** Ideco 136' mast, National C-350 and G-D FXQ pumps. Two 12 cylinder LeRois on draw works and FXQ pump. Two Waukesha LROs on C-350.

2. **EMSCO GA-500** Ideco 136' mast, National C-350 and G-D FXQ pumps. Two GM Twin diesels on draw works and FXQ pump. One GM Quad diesel on C-350 pump.

3. **EMSCO J-750** Ideco 136' mast, G-D FXL and Emsco P-16 pumps. Three GM Twin diesels on draw works, power takeoffs to both pumps, two GM Quad diesels, one on each pump.

4. **NATIONAL 125** One Oilwell 220P pump, one Oilwell 20P pump, one W-S 7P pump. Four Waukesha LRO engines with National fluid couplings on draw works with takeoff to 220P pump, two Waukesha LROs with National fluid couplings on 20P pump, one Waukesha EKH on 7P pump.

5. **K-W RIG** Emsco UB-54 draw works with National reverse gear, Ideco 136' mast, National C-350 and Emsco CA-16 pumps, two 12 cylinder LeRoi gas engines on draw works, two Waukesha LROs on C-350 pump, one Superior 6G510 on Emsco pump.

EACH OF THESE RIGS IS COMPLETE AND READY TO DRILL. EACH IS FULLY UNITIZED FOR SPEEDY MOVING AND RIGGING UP. REASONABLY PRICED. FOR FULL PARTICULARS AND COMPLETE INVENTORIES CONTACT

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Butane-Propane Plant

Complete plant, 70,000 gallon capacity consisting of the following:

TANKS (225 PSI):
1—13,500 gals. • 2—8,200 gals.
2—10,000 gals. • 2—3,500 gals.

VAPORIZING SYSTEM • UNLOADING COMPRESSOR

VAPOR PRESSURE REDUCING STATION

VAPOR-AIR MIXING & CONTROL SYSTEM*
*Includes Colormixer and Askania Ratio-Regulator, Pressure Difference Regulator and Motor Operated Adjuster.

THIS PLANT CAN BE PURCHASED COMPLETE, OR AS INDIVIDUAL UNITS SEPARATELY.

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FOR IMMEDIATE SHIPMENT, ranging in sizes from 1 to 100 HP. WRITE FOR LIST.

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DAYTON-DOWD, CENTRIFUGAL—For refinery use. Will handle material from 0.57 to 0.96 Sp. Gr. Ratings from 43 to 744 GPM, from 184' to 387' head (25).

ECONOMY—VSL 2½ (9).

ECONOMY CS-2½, turbine drive (2).

ECONOMY MF, turbine drive (1)

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GAS PURIFIER—2000 to 16,000 CFH.

INERT GAS PRODUCER—3,000 CFH.

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FOR SALE: Two 12", 3000# WP, QRC Blowout Preventers. Used but like new, $9,000.00 for both. Lum Price, 417 E. 16th, Houston, Texas. Phone UNderwood 8945.

NEW Double Drum Well Servicing Unit Double Pole, 140 Hp. Waukesha, Fully Equipped. Box D-940, The Oil and Gas Journal, Tulsa, Oklahoma.

AVAILABLE for sale and immediate shipment line pipe, seamless and lapweld casing, tanks. Call or write Edco Pipe & Supply Company, Box 565, Drumright, Oklahoma.

WELL EQUIPMENT: New and used spudders, rotaries, core drills—all sizes and types. Cable tools, drill pipe, bits, pipe. Fishing tools. Everything for Well Service. Pressey & Son, Pueblo, Colorado.

FOR SALE: Four ZC 503 & One ZC 208 used F & M Engines, good condition. Want good 2" or 2½" line pipe or tubing. Sell, buy or trade. Call, wire or write A. M. Moore, McCamey, Texas.

GAS COMPRESSORS
90 HP Direct Driven Superiors. Extra cylinders, 80 HP C & G Coopers. Location Oklahoma. Alfred B. Kern, 223 Wright Bldg., Tulsa, Oklahoma.

FOR SALE: Emsco JC 1250 sand reel, complete with substructure, 9500' of 5/8" wire line, in good condition, and complete Fawick air clutch. Assembly available for inspection by contacting Oil States Drilling Company, Box 1708, Big Spring, Texas, phone 2290-W. Price, $4250.00.

Drilling Equipment

Steam Power Rigs for Deep Drilling

P. O. Box 8072—Houston, Texas

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SEAMLESS OIL WELL CASING

5000' New J-55 5½" O.D., 14# 8 R.T., R.2.
5000' New J-55 5½" O.D., 15½# 8 R.T., R.2.

A-1 USED

4000' H-40 5½" O.D., 14# 8 R.T., R.2.
5800' Grade C 5½" O.D., 17# 10 V.T., R.2.
2500' H-40 & Grade C 7" O.D., 8 R.T. & 10 V.T., R.2.
1400' 10¾" O.D. 41.85# Drive Pipe, 8 V.T., R.1.

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9000' 5½" O.D. 17#
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3,000-ft. rotary rig. Wilson PA 100 engine. 9D 7¼ x 10 pump. Climax 160 HP engine. 900 ft. 4½ FA Emsco swivel. Traveling block. Wire line. 38 ft. kelly. 32 ft. DC Elevators, Slips, Hook. $16,000 cash. Box D-958, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Fort Worth J Spudder A1 condition, 10" Pipe Shear Pole Mast and almost new D88 Caterpillar Skid Power, Davis and Ives, Toronto, Kas.

FOR SALE: In Oklahoma—1 used 175 KW, 219 KVA, 480V, 264 Amp., 3 phase, 60 cycle, 1200 RPM—AC, Westinghouse generator (bought new 1935) Serial #1519N362, powered through Twin Disc clutches and V belts by Right & Left Rotation Sterling 150 HP 5¼" x 6", Gas, Gasoline, Butane 6 cyl. engines. Originally used for Rotary oil well drilling rig. $6,500.00. Cities Service Oil Co.—Patridge—Bartlesville, Okla.

FOR SALE: 2 Used Franks Mfg. Co., Tulsa, Core Drill Units, Model 1000—Mounted on Ford Trucks. Cities Service Oil Co.—Patridge—Bartlesville.

CATERPILLAR D-13000
Completely rebuilt and guaranteed. Priced right. Martin Tractor, Chanute, Kansas.

FOR SALE: Approximately 5,000 feet heavy Pennsylvania type tubing 2⅜" O.D. Contact Vaughn & Taylor Construction Co., Inc., 828 Hamilton Building, Wichita Falls, Texas, Phone 2-1821.

FOR SALE: 3500' of used 4½ drill pipe with 5¾" O.D. full hole tool joints. Melton Supply Company, Seminole, Oklahoma.

EQUIPMENT WANTED

WANTED: Good used well drilling equipment. Spudders, rotaries, large or small. Tools and general equipment. We distribute throughout the West with hundreds of customers. Pressey & Son, Pueblo, Colorado.

SWIVEL
3" Kelly and hose for reverse Circulator. Standard Drilling Company, Phone 3-4406, Oklahoma City, Okla.

WANTED: GAK Waukesha Motor, does not need to be in A-1 condition. Also, set of hydraulic jacks and rings for pulling casing. Crest Drilling Co., Petroleum Building, Wichita, Kansas.

GOOD Used Small Rotary Mounted, capable of drilling 1,500', Box 285, Iola, Kansas, or phone Office 355, Res. 278.

WANTED TO BUY—Good used drilling machine and equipment, capable of drilling to 3000 feet. Ralph M. Tolson, 816 Grandview, Pawhuska, Okla. Phone 834.

WANTED TO BUY OIL WELL TYPE ELECTRIC MOTORS

Ratings 15/30 Hp., 20/50 Hp. 25/65 Hp.
Send listing on any other Motors, Control, Cable, Wiring Supplies.

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Major oil field equipment manufacturer has position open for Assistant to Vice President. Must be capable of developing defense contracts and new products sales. Give qualifications and experience. All communications confidential. Box D-955, The Oil and Gas Journal, Tulsa, Oklahoma.

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GEOPHYSICIST: Fully qualified and experienced for position of Chief Geophysicist with well-known contracting company. Application must state complete qualifications, references and salary expected. Box D-918, The Oil and Gas Journal, Tulsa, Oklahoma.

SEISMOGRAPH PARTY CHIEF and Computer wanted by new aggressive company. Box D-920, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men. Salaried positions—$3600 to $30,000. This confidential service for outstanding men who desire a change of connection. Will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 1204 Berger Bldg., Pittsburgh 19, Pa.

CHIEF Geophysicist for Venezuelan assignment. Must be proficient in handling seismic, gravity, torsion balance, magnetic and other data. Should have college degree in geology and/or geophysics plus active experience in geophysics. Give full details in reply to P. O. Box 2819, Dallas, Texas.

WANTED: LAND MAN
Thoroughly experienced in Oklahoma Oil Fields. Box D-935, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICAL SURVEYOR: Minimum two years' experience on transit; do not apply otherwise. Box D-921, The Oil and Gas Journal, Tulsa, Oklahoma.

SALES ENGINEER with recent mechanical engineering degree to join organization handling equipment for refineries, gasoline and chemical plants in Houston. Experience not essential. Box D-948, The Oil and Gas Journal, Tulsa, Oklahoma.

ELECTRICAL Engineer with crude oil pipe line experience. Familiar with design of electric pump stations, auxiliary electric machinery and equipment, remote control circuits, power sub-station and distribution circuits for installations up to 5,000 horsepower. Familiarity with communication circuits and electronic equipment also required. Include full professional and personal details first letter. Box D-933, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Two geologists for assignment Middle East. Must be single and have at least three years surface experience with good background in stratigraphy. Reply Box D-956, The Oil & Gas Journal, Tulsa, Oklahoma.

EXECUTIVE GEOLOGIST: A sizable company with headquarters in Tulsa engaged in various branches of the oil industry, but heretofore not extensively in the production branch, desires to contact someone who from ability and experience could take the lead in deciding on a slow but expanding production program and who could slowly but steadily get such a program started and under way—hiring from time to time qualified men to round out an adequate Exploratory Production Department, compensation would be on a salary basis only but commensured with experience and growth of activities under your supervision. Replies will be treated strictly confidential in all cases. Box D-957, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED by progressive independent an experienced lease and landman for North Central Texas. All replies held in strict confidence. Box D-960, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Associate or full professor of Petroleum Engineering in a leading institution. Must have successful professional and research background. Work to begin September fifteenth. Box D-897, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED:
PIPE LINE ENGINEER-ECONOMIST

Large integrated oil company wishes to engage in staff capacity an experienced pipe line engineer who has ability and experience in economic analysis of crude oil and products, pipe line facilities—both existing and proposed. Company does not have man specializing in this field. Location would be in home office in Eastern United States. Please state age, experience, and give references with first reply. D-964, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

WANTED: College graduate, three or more years' experience in petroleum refining, for technical sales in established line of chemical products used by petroleum industry. Locations—Gulf Coast Area, West Coast. Letter should include details of education and experience, family and military status, salary expected and recent photo. State geographical preference. Box D-939, The Oil and Gas Journal, Tulsa, Oklahoma.

FOREIGN and Domestic Oil Employment Directory covering the oil industry, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla.

EXPERIENCED Petroleum Engineer, by Independent Geological Firm, familiar with Secondary Recovery and experienced in making appraisal reports. In applying please give detailed experience and salary expected. Interest participation if qualified. Box D-942, The Oil and Gas Journal, Tulsa, Oklahoma.

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Write in complete detail, giving positions held, references, education, salary expected. Personal interview can be arranged.

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SITUATIONS WANTED

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 131, Ph. No. 131, Hobbs, New Mexico.

DRILLING Contractor operating in West Texas and New Mexico desires to contact small or medium-sized independent oil company who needs an operating manager. Personal interview desired. Twenty years experience in all phases of the oil industry. Address replies to Box D-644, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM and Gas Chemist, B.S., 14 years experience, married, 38 years old, wants position Dallas, Texas, only. Member A.C.S. and A.S.T.M. Excellent references. Box D-944, The Oil and Gas Journal, Tulsa, Okla.

GEOPHYSICIST 15 years experience available July seeks permanent location supervising interpreting reviewing seismic gravity magnetics in Caribbean Area, Brazil, Mexico, Peru. Box D-937, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST-LANDMAN. Wide and varied experience, now with major company and wishes to remain in Rocky Mountain Area. Capable of taking complete charge of operations. Desires salary-interest or will consider retainer basis. Box D-929, The Oil and Gas Journal.

GEOLOGIST: Age 35, married, 12 years major and independent company experience in Texas and Louisiana Gulf Coast, Southwest Texas, West Texas-New Mexico. Desire connection with Active independent. Excellent references. Box D-952, The Oil and Gas Journal, Tulsa, Oklahoma.

CIVIL ENGINEER, Graduate, Registered in Illinois. Several years Major Oil Company experience includes Oil Well Locations, Land Surveys, Pipe Line Surveys, Property Inventory, Dredging of Canals and Waterways, Core Drill Surveys, Design and some construction. Also five years' Seismograph Exploration experience. If no opening will train as Production, Refinery, or Gas Plant Engineer. Married, one child school age. No draft status. Box D-959, The Oil and Gas Journal, Tulsa, Okla.

GRADUATE PETROLEUM ENGINEER with one year's experience in drilling, well completions, production and workovers. Desires job with an opportunity for advancement. Box D-961, The Oil and Gas Journal, Tulsa, Oklahoma.

AVAILABLE IMMEDIATELY: COMPTROLLER—advanced through credits, office manager and cost accountant. Presently employed, seeks affiliation with reputable independent oil company. 25 years' experience relating production, refining, marketing and transportation. Excellent references. Box D-963, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST, Ph.D. candidate, over five years experience, seeks employment anywhere with oil company or consultant. Write L. Banks, 500 Elm Road, State College, Pa.

FORMER Independent Oil Operator ten years, with legal education, plus eight years Wall Street experience, desires connection raise funds exploratory well drilling from excess profits taxpayers. Box D-938, The Oil and Gas Journal, Tulsa, Oklahoma.

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SPOT CASH PAID FOR PRODUCING ROYALTY. SMALL TO LARGEST BLOCKS IN SETTLED OR OLD PRODUCTION ONLY. Oil Specialists since 1934. GERBER & CO., 120 WALL STREET, NEW YORK.

WE will buy your producing override royalties and oil payments, no matter how small. Emray Oil Co., B. R. Irwin, President, 1045 Electric Bldg., Houston, Texas. Phone—Charter 3479.

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

MONTANA ROYALTIES
Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1225, Great Falls, Montana.

PRIVATE PARTY wants to invest up to $150,000.00 in producing royalties or settled production. Small or large deals considered. Box D-912, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASE AND DRILLING BLOCKS

A GOOD SPECULATION in oil development is filing on Government Lands in potential developing areas. Write: S. W. Pressey, Box 614, Pueblo, Colorado.

WANTED: Co-Owner. Small Independent Oil Company has 3 lease blocks totaling 960 acres. Requires immediate action. Within one mile of production 1500 total depth. Will sell ½ working interest in each block for $7,000.00 if a producer, $5,000.00 if dry. Now own all equipment to drill, complete and produce. Geology upon request. Box D-962, The Oil and Gas Journal, Tulsa, Oklahoma.

20,000 A. solid block 10 yr. oil and gas lease, Western Kansas. $1.00 yearly rental. H. C. Jacobs, 352 N. Main Street, Wichita, Kansas.

COLORADO Oil-Gas Leases: Lincoln County, 10,000 acres; Kiowa County, 15,000 acres; Crowley County, 15,000 acres. All or part for sale at $1.00/acre (Renewal-$0.50/acre). For Sale: Ranch land with oil possibilities. E. H. Grantham, Realtor, Ordway, Colorado.

ATTENTION CAPITAL OIL INVESTORS. We have large acreage offsetting 400 bbl. well acreage in Ill. Also acreage in Okla., Kansas ready to drill. We can present at this time the work of our oil locator instrument, which works only on oil in the structures. Acreage surveyed by instrument which has proven accurate in last thirty wells surveyed. This is your opportunity for good investment. If interested in helping finance above acreage, write: Anglo-American Co-Operative Oil Co., 69 West Washington St., Suite 1209, Chicago, Ill.

240 ACRE LEASE in Wabash County, Southern Illinois, for assignment to right party for drilling contract and override. Can furnish section location, has lime, sand formation, also good pumper. Lease is ¼ mile from pipeline. For all information write: Mrs. Grace V. Tanquary, 438 Plum Street, Aurora, Illinois.

FOR SALE: Oil and Gas Leases adjoining producing leases, also wildcat leases, Drilling propositions and small producing properties; all in shallow territory. W. P. Harley, Bowling Green, Ky.

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FOR SALE—PRODUCING OIL LEASE
Almost 700 acres solid body, Eastern Kansas. Very shallow, low production cost. Oil 32° gravity. Suitable for water flood. Pumping units. Heavy steel storage tanks. Major pipe line crosses lease. Have core analysis and laboratory test.
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LEASE AND DRILLING BLOCKS

PLANNING to develop a partly proven oil-gas field in Allegany County, N. Y. Interest may be had for cash or good used casing, drive pipe and well equipment. If interested, write for details. C. N. Wilber, Box 625, Westfield, Pa.

IDEAL drilling block 1171 A in Shelby Co. Texas surrounded by Major Co. Holdings both shallow and deep prospects consider drilling deal or cash. C. A. Parker, Center Texas.

ARIZONA five-year leases and drilling blocks, good geology, 620 Luhrs Building, Phoenix, Arizona.

WATER flood prospect in Allen County, Kansas, now available for salvage plus limited override to a responsible operator only, preferably one with water flood experience. Approximately 100 proven acres of Bartlesville sand—700' deep—32 gravity oil. One core (good) taken by owners—coring option if desired. Box D-949, The Oil and Gas Journal, Tulsa, Oklahoma.

DEVELOPMENT Contract, Several Drilling Blocks having attractive geology. Also Natural Gas Distribution and Development project having 500 possible taps. Old oil production for sale. C. P. Taneyhill, Industrial Engineer, P.O. Box 304, Bowling Green, Kentucky.

SACRIFICE for immediate cash, 7½ per cent, 4 wells, $30,500, marvelous potential; Alberta. Write today. Box D-945, The Oil and Gas Journal, Tulsa, Oklahoma.

REAL ESTATE

60 A. ESTATE, Orange County, Calif. Part Citrus. Excellent location, 22 miles L. A. City Hall. Leased to Major Oil Co. 50% mineral rights, $1750 per acre. Terms. FRontier 28138, R. D. Freed, 438 30th St., Hermosa Beach, Calif.

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Tortuguero Test Abandoned

The Tortuguero 10 test of Mexican American Independent Oil Co. in southern Mexico has been plugged and abandoned after showing salt water in upper sands and noncommercial gas at greater depth. The well was drilled to 6,408 ft.

German Fields Extended

Extensions to two of Western Germany's Emsland fields have been made as a result of current drilling in the area.

About ½ mile west of the Scheerhorn discovery, Well No. 10 of the German producer, C. Deilmann, flowed an initial daily production of about 95 bbl. through a 1-in. choke from the Bentheim sand at 3,570 ft. The field was discovered in 1949.

Another stepout was in Lingen-Dalum field. Lingen-Wachendorf 1 on the Lingen concession jointly owned by Deutsche Schachtbau und Tiefbohr Gmbh., Deutsche Vacuum, and Gerwerkschaft Elwerath, in a preliminary production test from the Valendis at 2,900 ft. produced about 10 bbl.

LEGAL

Sealed bids for oil and gas mining leases on certain trust lands on the Crow Indian Reservation, Big Horn County, State of Montana, will be received at the Office of the Superintendent, Crow Indian Agency, Crow Agency, Montana, up to 2:00 o'clock, P.M., Montana Standard Time, April 27, 1951. For further information, call or write L. C. Lippert, Superintendent, Crow Indian Agency, Crow Agency, Montana.

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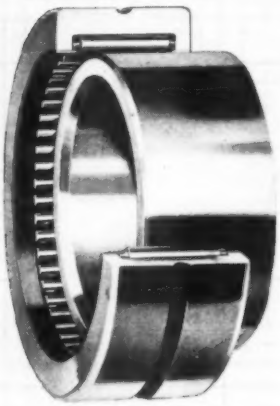
giant NATIONAL pumper

...Torrington Bearing-equipped



The Torrington Type NCS Needle Bearings in this mammoth National Supply Company Pumper were specified to achieve the walking beam API load rating of 32,400 pounds.

The full complement of rollers in Type NCS Needle Bearings provides high capacity and helps distribute lubricant evenly over all bearing surfaces. Type NCS Needle Bearings simplify design and assembly of saddle and pitman bearing units.

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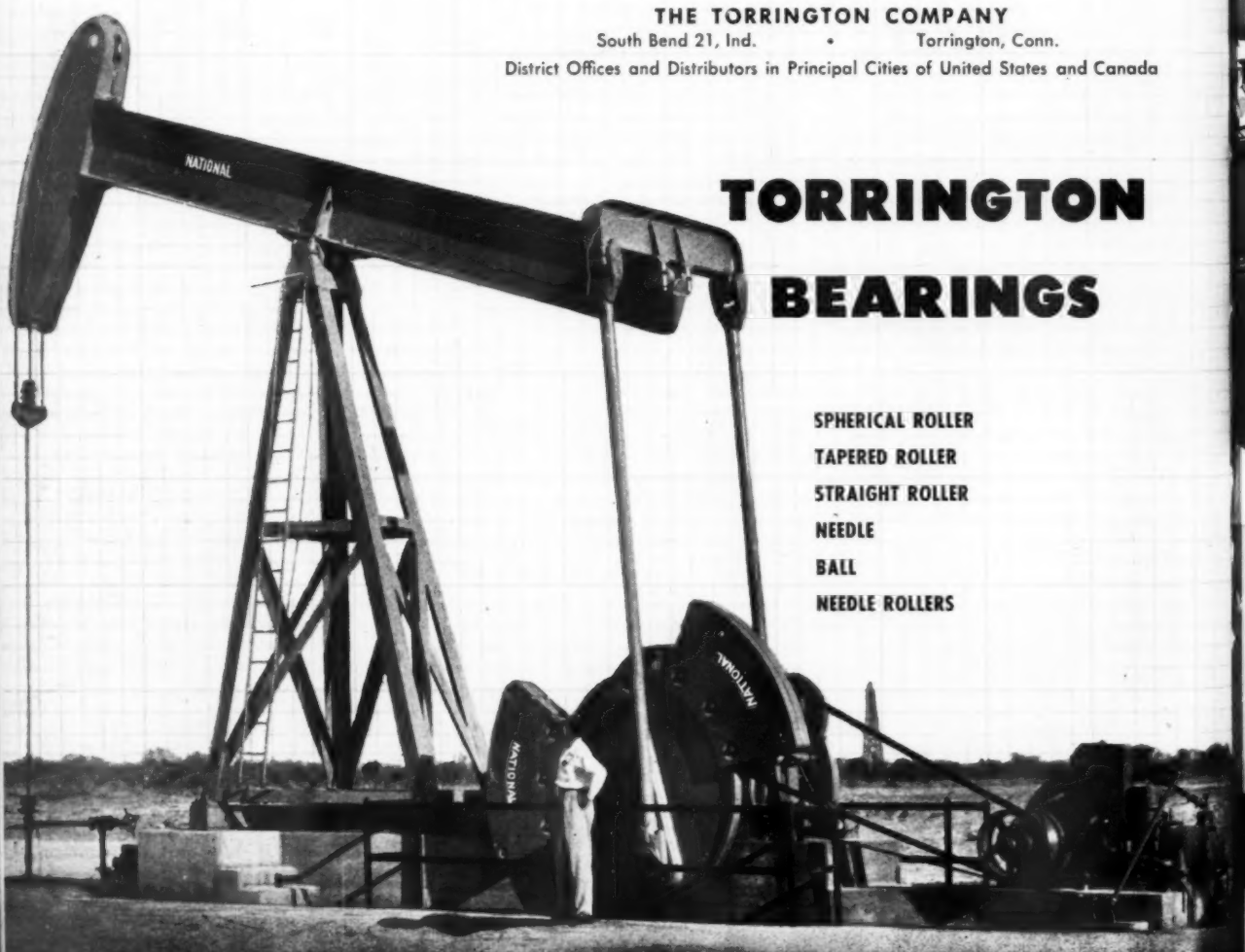

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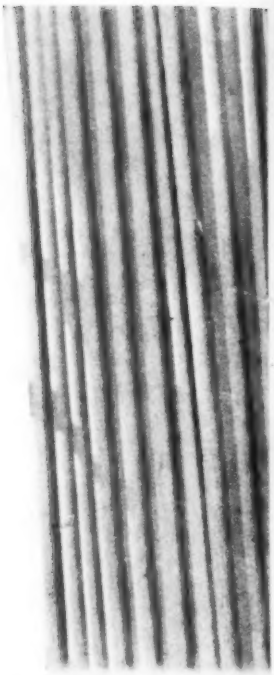
You're never in doubt with Hughes Flash-Weld Tool Joints

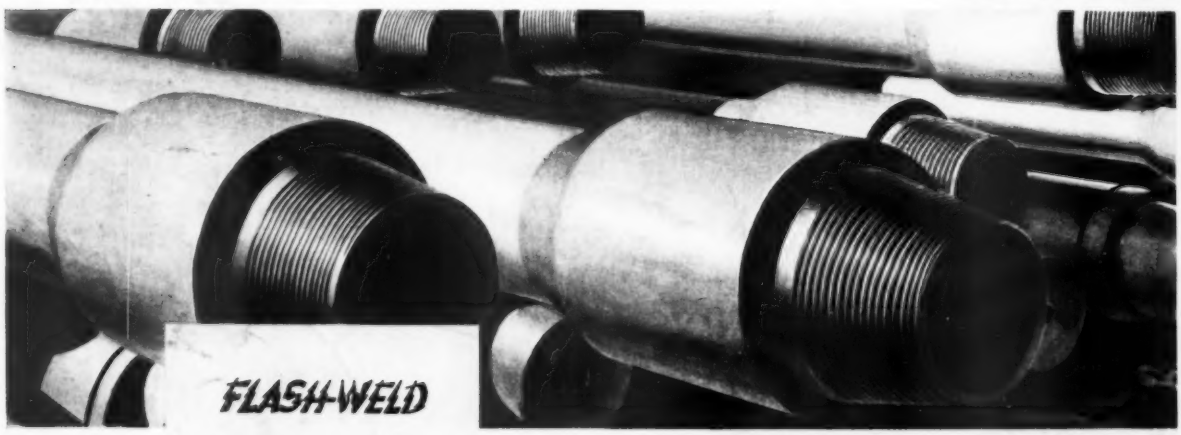


IN MILLIONS OF FEET OF HOLE, drilled in thousands of wells, Hughes Flash-Weld tool joints have set a record for unequaled dependability.

There's a very solid reason for this. Fifteen years ago, Hughes undertook the designing of a better type of drill stem. Engineers and metallurgists spent three years in full-scale research in developing the welded-type joint and the specially designed flash-welding machines and process now used.

Since offering them to the trade 12 years ago, more than 19,000,000 feet of drill stem have been equipped with Hughes Flash-Weld tool joints. During this period, design and manufacturing techniques have been constantly improved.

There has been no known failure in the weld of a Hughes Flash-Weld tool joint processed in the past two years.



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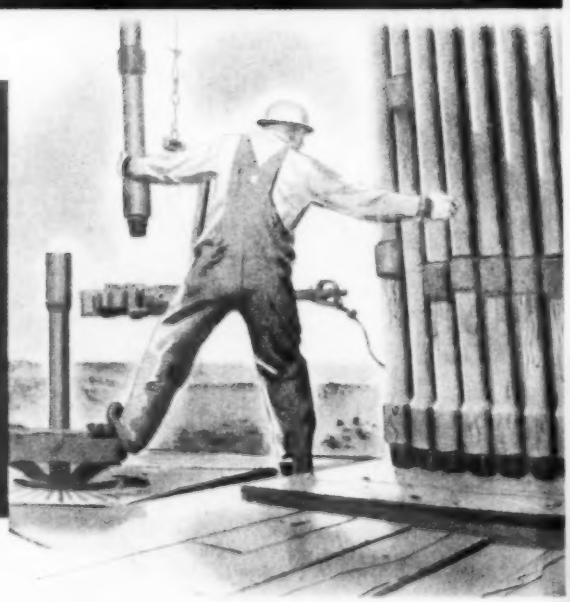
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